

# Applications PSC-SNE

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## Cases

### Case 1

Sample on the  $(\mathbb{S}^1)^2$  where  $p = 1$  and  $r = 2$ .

Data:

```
# Sample on the (S^1)^2
n <- 200
vmf11 <- rotasym::r_vMF(n = n, mu = drop(DirStats::to_cir(th = 0)), kappa = 10)
vmf12 <- rotasym::r_vMF(n = n, mu = drop(DirStats::to_cir(th = pi)), kappa = 10)
x1 <- sdetorus::toPiInt(cbind(DirStats::to_rad(vmf11),
                                DirStats::to_rad(vmf12)))

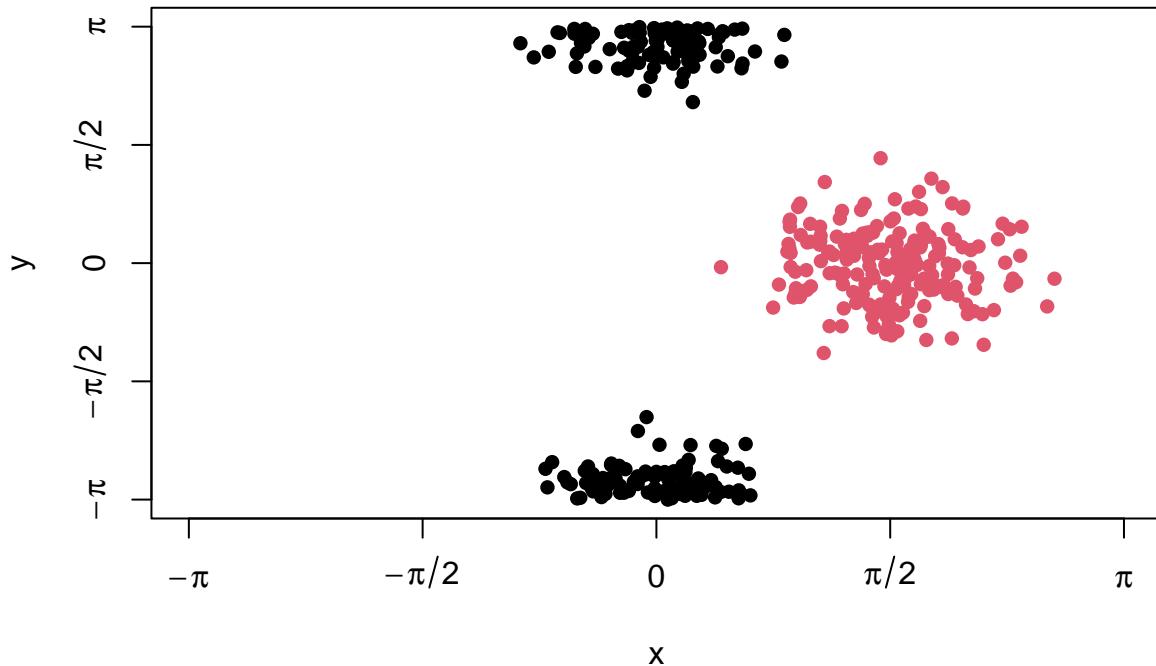
vmf21 <- rotasym::r_vMF(n = n, mu = drop(DirStats::to_cir(th = pi / 2)), kappa = 5)
vmf22 <- rotasym::r_vMF(n = n, mu = drop(DirStats::to_cir(th = 0)), kappa = 5)
x2 <- sdetorus::toPiInt(cbind(DirStats::to_rad(vmf21),DirStats::to_rad(vmf22)))

x <- rbind(x1, x2)

# Cartesian coordinates
n <- 400
x_array <- array(dim = c(n, 2, 2))
x_array[, , 1] <- DirStats::to_cir(x[, 1])
x_array[, , 2] <- DirStats::to_cir(x[, 2])

indexes <- sample(1:n)
x_array <- x_array[indexes,,]
colors <- rep(c(1, 2), each = n/2)[indexes]

plot(x, xlim = c(-pi, pi), ylim = c(-pi, pi), axes = FALSE,
      col = rep(c(1, 2), each = n/2), pch = 16,
      xlab = "x", ylab = "y")
sdetorus::torusAxis()
```



Let's calculate the rho parameters based on a perplexity of 20:

```
# Time difference of 27.58008 secs
rho_first_20 <- rho_optim_bst(x_array, 20)
```

```
## Time difference of 23.66001 secs
```

First, let's reduce to dimension  $\mathbb{S}^1$  then  $d = 1$  (circumference):

```
res_pscsne <- psc_sne(X=x_array, d=1, rho_psc_list = rho_first_20,
                        num_iteration=500, colors=colors, show_prog = TRUE)
```

```
## It: 1; obj: 1.689e+01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.611e-01; mom: 0.000e+00;
## best it: 1; best obj: 1.689e+01

## It: 2; obj: 1.602e+01; abs: 8.689e-01; rel: 5.144e-02; norm: 3.635e-01; mom: 6.118e+00;
## best it: 2; best obj: 1.602e+01
## It: 3; obj: 1.558e+01; abs: 4.446e-01; rel: 2.775e-02; norm: 5.173e-01; mom: 3.238e+00;
## best it: 3; best obj: 1.558e+01
## It: 4; obj: 1.535e+01; abs: 2.234e-01; rel: 1.434e-02; norm: 6.084e-01; mom: 2.005e+00;
## best it: 4; best obj: 1.535e+01
## It: 5; obj: 1.520e+01; abs: 1.515e-01; rel: 9.865e-03; norm: 6.579e-01; mom: 1.238e+00;
## best it: 5; best obj: 1.520e+01
## It: 6; obj: 1.506e+01; abs: 1.406e-01; rel: 9.251e-03; norm: 6.921e-01; mom: 9.802e-01;
## best it: 6; best obj: 1.506e+01
## It: 7; obj: 1.494e+01; abs: 1.226e-01; rel: 8.139e-03; norm: 7.237e-01; mom: 8.913e-01;
## best it: 7; best obj: 1.494e+01
## It: 8; obj: 1.483e+01; abs: 1.089e-01; rel: 7.288e-03; norm: 7.530e-01; mom: 8.235e-01;
## best it: 8; best obj: 1.483e+01
## It: 9; obj: 1.475e+01; abs: 7.973e-02; rel: 5.376e-03; norm: 7.790e-01; mom: 7.259e-01;
## best it: 9; best obj: 1.475e+01
## It: 10; obj: 1.469e+01; abs: 6.301e-02; rel: 4.271e-03; norm: 8.005e-01; mom: 6.026e-01;
## best it: 10; best obj: 1.469e+01
## It: 11; obj: 1.463e+01; abs: 5.406e-02; rel: 3.680e-03; norm: 8.167e-01; mom: 5.052e-01;
## best it: 11; best obj: 1.463e+01
```

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## It: 12; obj: 1.459e+01; abs: 4.726e-02; rel: 3.230e-03; norm: 8.298e-01; mom: 4.601e-01;
## best it: 12; best obj: 1.459e+01
## It: 13; obj: 1.454e+01; abs: 4.213e-02; rel: 2.888e-03; norm: 8.400e-01; mom: 4.237e-01;
## best it: 13; best obj: 1.454e+01
## It: 14; obj: 1.451e+01; abs: 3.859e-02; rel: 2.653e-03; norm: 8.481e-01; mom: 3.954e-01;
## best it: 14; best obj: 1.451e+01
## It: 15; obj: 1.447e+01; abs: 3.697e-02; rel: 2.548e-03; norm: 8.543e-01; mom: 3.789e-01;
## best it: 15; best obj: 1.447e+01
## It: 16; obj: 1.443e+01; abs: 3.800e-02; rel: 2.626e-03; norm: 8.593e-01; mom: 3.709e-01;
## best it: 16; best obj: 1.443e+01
## It: 17; obj: 1.439e+01; abs: 4.103e-02; rel: 2.844e-03; norm: 8.638e-01; mom: 3.708e-01;
## best it: 17; best obj: 1.439e+01
## It: 18; obj: 1.435e+01; abs: 4.228e-02; rel: 2.938e-03; norm: 8.682e-01; mom: 3.767e-01;
## best it: 18; best obj: 1.435e+01
## It: 19; obj: 1.431e+01; abs: 3.883e-02; rel: 2.706e-03; norm: 8.725e-01; mom: 3.762e-01;
## best it: 19; best obj: 1.431e+01
## It: 20; obj: 1.428e+01; abs: 3.346e-02; rel: 2.339e-03; norm: 8.759e-01; mom: 3.560e-01;
## best it: 20; best obj: 1.428e+01
## It: 21; obj: 1.425e+01; abs: 2.853e-02; rel: 1.998e-03; norm: 8.785e-01; mom: 3.279e-01;
## best it: 21; best obj: 1.425e+01
## It: 22; obj: 1.422e+01; abs: 2.426e-02; rel: 1.703e-03; norm: 8.808e-01; mom: 3.059e-01;
## best it: 22; best obj: 1.422e+01
## It: 23; obj: 1.420e+01; abs: 2.107e-02; rel: 1.481e-03; norm: 8.832e-01; mom: 2.907e-01;
## best it: 23; best obj: 1.420e+01
## It: 24; obj: 1.418e+01; abs: 1.963e-02; rel: 1.383e-03; norm: 8.863e-01; mom: 2.843e-01;
## best it: 24; best obj: 1.418e+01
## It: 25; obj: 1.416e+01; abs: 1.954e-02; rel: 1.378e-03; norm: 8.904e-01; mom: 2.864e-01;
## best it: 25; best obj: 1.416e+01

## It: 26; obj: 1.414e+01; abs: 1.912e-02; rel: 1.350e-03; norm: 8.958e-01; mom: 2.856e-01;
## best it: 26; best obj: 1.414e+01
## It: 27; obj: 1.413e+01; abs: 1.708e-02; rel: 1.208e-03; norm: 9.022e-01; mom: 2.750e-01;
## best it: 27; best obj: 1.413e+01
## It: 28; obj: 1.411e+01; abs: 1.355e-02; rel: 9.592e-04; norm: 9.089e-01; mom: 2.533e-01;
## best it: 28; best obj: 1.411e+01
## It: 29; obj: 1.410e+01; abs: 9.943e-03; rel: 7.046e-04; norm: 9.157e-01; mom: 2.267e-01;
## best it: 29; best obj: 1.410e+01
## It: 30; obj: 1.410e+01; abs: 7.115e-03; rel: 5.045e-04; norm: 9.227e-01; mom: 2.101e-01;
## best it: 30; best obj: 1.410e+01
## It: 31; obj: 1.409e+01; abs: 5.110e-03; rel: 3.625e-04; norm: 9.299e-01; mom: 2.061e-01;
## best it: 31; best obj: 1.409e+01
## It: 32; obj: 1.408e+01; abs: 6.684e-03; rel: 4.744e-04; norm: 9.373e-01; mom: 2.122e-01;
## best it: 32; best obj: 1.408e+01
## It: 33; obj: 1.407e+01; abs: 1.248e-02; rel: 8.860e-04; norm: 9.447e-01; mom: 3.256e-01;
## best it: 33; best obj: 1.407e+01
## It: 34; obj: 1.407e+01; abs: 4.654e-03; rel: 3.308e-04; norm: 9.520e-01; mom: 4.201e-01;
## best it: 34; best obj: 1.407e+01
## It: 35; obj: 1.406e+01; abs: 3.281e-03; rel: 2.332e-04; norm: 9.586e-01; mom: 1.914e-01;
## best it: 35; best obj: 1.406e+01
## It: 36; obj: 1.406e+01; abs: 2.126e-03; rel: 1.511e-04; norm: 9.647e-01; mom: 1.790e-01;
## best it: 36; best obj: 1.406e+01
## It: 37; obj: 1.406e+01; abs: 7.926e-04; rel: 5.637e-05; norm: 9.703e-01; mom: 1.700e-01;
## best it: 37; best obj: 1.406e+01
## It: 38; obj: 1.406e+01; abs: 7.801e-04; rel: 5.548e-05; norm: 9.754e-01; mom: 1.633e-01;

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## best it: 37; best obj: 1.406e+01
## It: 39; obj: 1.406e+01; abs: 2.440e-03; rel: 1.735e-04; norm: 9.800e-01; mom: 1.553e-01;
## best it: 37; best obj: 1.406e+01
## It: 40; obj: 1.407e+01; abs: 4.006e-03; rel: 2.848e-04; norm: 9.844e-01; mom: 1.452e-01;
## best it: 37; best obj: 1.406e+01
## It: 41; obj: 1.407e+01; abs: 5.327e-03; rel: 3.787e-04; norm: 9.884e-01; mom: 1.338e-01;
## best it: 37; best obj: 1.406e+01
## It: 42; obj: 1.408e+01; abs: 6.347e-03; rel: 4.510e-04; norm: 9.922e-01; mom: 1.222e-01;
## best it: 37; best obj: 1.406e+01
## It: 43; obj: 1.409e+01; abs: 7.072e-03; rel: 5.023e-04; norm: 9.957e-01; mom: 1.117e-01;
## best it: 37; best obj: 1.406e+01
## It: 44; obj: 1.409e+01; abs: 7.550e-03; rel: 5.360e-04; norm: 9.990e-01; mom: 1.031e-01;
## best it: 37; best obj: 1.406e+01
## It: 45; obj: 1.410e+01; abs: 7.837e-03; rel: 5.560e-04; norm: 1.002e+00; mom: 9.735e-02;
## best it: 37; best obj: 1.406e+01
## It: 46; obj: 1.411e+01; abs: 7.986e-03; rel: 5.663e-04; norm: 1.005e+00; mom: 9.485e-02;
## best it: 37; best obj: 1.406e+01
## It: 47; obj: 1.412e+01; abs: 8.030e-03; rel: 5.691e-04; norm: 1.008e+00; mom: 9.591e-02;
## best it: 37; best obj: 1.406e+01
## It: 48; obj: 1.413e+01; abs: 7.953e-03; rel: 5.634e-04; norm: 1.010e+00; mom: 1.009e-01;
## best it: 37; best obj: 1.406e+01
## It: 49; obj: 1.413e+01; abs: 7.580e-03; rel: 5.366e-04; norm: 1.013e+00; mom: 1.109e-01;
## best it: 37; best obj: 1.406e+01
## It: 50; obj: 1.414e+01; abs: 6.130e-03; rel: 4.337e-04; norm: 1.015e+00; mom: 1.292e-01;
## best it: 37; best obj: 1.406e+01

## It: 51; obj: 1.414e+01; abs: 1.572e-03; rel: 1.111e-04; norm: 1.017e+00; mom: 1.633e-01;
## best it: 37; best obj: 1.406e+01
## It: 52; obj: 1.413e+01; abs: 6.080e-03; rel: 4.300e-04; norm: 1.020e+00; mom: 2.218e-01;
## best it: 37; best obj: 1.406e+01
## It: 53; obj: 1.412e+01; abs: 1.098e-02; rel: 7.768e-04; norm: 1.023e+00; mom: 2.818e-01;
## best it: 37; best obj: 1.406e+01
## It: 54; obj: 1.411e+01; abs: 1.001e-02; rel: 7.089e-04; norm: 1.026e+00; mom: 3.044e-01;
## best it: 37; best obj: 1.406e+01
## It: 55; obj: 1.411e+01; abs: 4.067e-03; rel: 2.882e-04; norm: 1.029e+00; mom: 2.841e-01;
## best it: 37; best obj: 1.406e+01
## It: 56; obj: 1.411e+01; abs: 1.077e-04; rel: 7.634e-06; norm: 1.031e+00; mom: 2.078e-01;
## best it: 37; best obj: 1.406e+01
## It: 57; obj: 1.411e+01; abs: 1.206e-03; rel: 8.548e-05; norm: 1.032e+00; mom: 1.263e-01;
## best it: 37; best obj: 1.406e+01
## It: 58; obj: 1.411e+01; abs: 1.617e-03; rel: 1.146e-04; norm: 1.033e+00; mom: 8.064e-02;
## best it: 37; best obj: 1.406e+01
## It: 59; obj: 1.411e+01; abs: 1.713e-03; rel: 1.214e-04; norm: 1.034e+00; mom: 6.199e-02;
## best it: 37; best obj: 1.406e+01
## It: 60; obj: 1.412e+01; abs: 1.666e-03; rel: 1.180e-04; norm: 1.035e+00; mom: 5.703e-02;
## best it: 37; best obj: 1.406e+01
## It: 61; obj: 1.412e+01; abs: 1.535e-03; rel: 1.088e-04; norm: 1.036e+00; mom: 5.647e-02;
## best it: 37; best obj: 1.406e+01
## It: 62; obj: 1.412e+01; abs: 1.340e-03; rel: 9.492e-05; norm: 1.036e+00; mom: 5.753e-02;
## best it: 37; best obj: 1.406e+01
## It: 63; obj: 1.412e+01; abs: 1.084e-03; rel: 7.679e-05; norm: 1.037e+00; mom: 5.960e-02;
## best it: 37; best obj: 1.406e+01
## It: 64; obj: 1.412e+01; abs: 7.621e-04; rel: 5.397e-05; norm: 1.037e+00; mom: 6.252e-02;
## best it: 37; best obj: 1.406e+01

```

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## It: 65; obj: 1.412e+01; abs: 3.625e-04; rel: 2.567e-05; norm: 1.038e+00; mom: 6.626e-02;
## best it: 37; best obj: 1.406e+01
## It: 66; obj: 1.412e+01; abs: 1.299e-04; rel: 9.198e-06; norm: 1.039e+00; mom: 7.080e-02;
## best it: 37; best obj: 1.406e+01
## It: 67; obj: 1.412e+01; abs: 7.309e-04; rel: 5.176e-05; norm: 1.039e+00; mom: 7.612e-02;
## best it: 37; best obj: 1.406e+01
## It: 68; obj: 1.412e+01; abs: 1.451e-03; rel: 1.027e-04; norm: 1.040e+00; mom: 8.216e-02;
## best it: 37; best obj: 1.406e+01
## It: 69; obj: 1.412e+01; abs: 2.285e-03; rel: 1.618e-04; norm: 1.040e+00; mom: 8.880e-02;
## best it: 37; best obj: 1.406e+01
## It: 70; obj: 1.411e+01; abs: 3.203e-03; rel: 2.269e-04; norm: 1.041e+00; mom: 9.580e-02;
## best it: 37; best obj: 1.406e+01
## It: 71; obj: 1.411e+01; abs: 4.139e-03; rel: 2.933e-04; norm: 1.041e+00; mom: 1.028e-01;
## best it: 37; best obj: 1.406e+01
## It: 72; obj: 1.410e+01; abs: 5.001e-03; rel: 3.544e-04; norm: 1.042e+00; mom: 1.093e-01;
## best it: 37; best obj: 1.406e+01
## It: 73; obj: 1.410e+01; abs: 5.697e-03; rel: 4.039e-04; norm: 1.042e+00; mom: 1.147e-01;
## best it: 37; best obj: 1.406e+01
## It: 74; obj: 1.409e+01; abs: 6.166e-03; rel: 4.374e-04; norm: 1.042e+00; mom: 1.188e-01;
## best it: 37; best obj: 1.406e+01
## It: 75; obj: 1.409e+01; abs: 6.394e-03; rel: 4.537e-04; norm: 1.043e+00; mom: 1.211e-01;
## best it: 37; best obj: 1.406e+01

## It: 76; obj: 1.408e+01; abs: 6.399e-03; rel: 4.543e-04; norm: 1.043e+00; mom: 1.219e-01;
## best it: 37; best obj: 1.406e+01
## It: 77; obj: 1.407e+01; abs: 6.219e-03; rel: 4.417e-04; norm: 1.043e+00; mom: 1.211e-01;
## best it: 37; best obj: 1.406e+01
## It: 78; obj: 1.407e+01; abs: 5.911e-03; rel: 4.200e-04; norm: 1.042e+00; mom: 1.191e-01;
## best it: 37; best obj: 1.406e+01
## It: 79; obj: 1.406e+01; abs: 5.552e-03; rel: 3.947e-04; norm: 1.042e+00; mom: 1.165e-01;
## best it: 37; best obj: 1.406e+01
## It: 80; obj: 1.406e+01; abs: 5.230e-03; rel: 3.719e-04; norm: 1.041e+00; mom: 1.137e-01;
## best it: 80; best obj: 1.406e+01
## It: 81; obj: 1.405e+01; abs: 5.027e-03; rel: 3.577e-04; norm: 1.040e+00; mom: 1.116e-01;
## best it: 81; best obj: 1.405e+01
## It: 82; obj: 1.405e+01; abs: 5.005e-03; rel: 3.562e-04; norm: 1.040e+00; mom: 1.108e-01;
## best it: 82; best obj: 1.405e+01
## It: 83; obj: 1.404e+01; abs: 5.191e-03; rel: 3.696e-04; norm: 1.039e+00; mom: 1.116e-01;
## best it: 83; best obj: 1.404e+01
## It: 84; obj: 1.404e+01; abs: 5.587e-03; rel: 3.979e-04; norm: 1.038e+00; mom: 1.142e-01;
## best it: 84; best obj: 1.404e+01
## It: 85; obj: 1.403e+01; abs: 6.157e-03; rel: 4.386e-04; norm: 1.037e+00; mom: 1.182e-01;
## best it: 85; best obj: 1.403e+01
## It: 86; obj: 1.402e+01; abs: 6.816e-03; rel: 4.858e-04; norm: 1.036e+00; mom: 1.232e-01;
## best it: 86; best obj: 1.402e+01
## It: 87; obj: 1.402e+01; abs: 7.423e-03; rel: 5.293e-04; norm: 1.036e+00; mom: 1.284e-01;
## best it: 87; best obj: 1.402e+01
## It: 88; obj: 1.401e+01; abs: 7.797e-03; rel: 5.563e-04; norm: 1.035e+00; mom: 1.329e-01;
## best it: 88; best obj: 1.401e+01
## It: 89; obj: 1.400e+01; abs: 7.797e-03; rel: 5.566e-04; norm: 1.035e+00; mom: 1.358e-01;
## best it: 89; best obj: 1.400e+01
## It: 90; obj: 1.399e+01; abs: 7.411e-03; rel: 5.294e-04; norm: 1.034e+00; mom: 1.362e-01;
## best it: 90; best obj: 1.399e+01
## It: 91; obj: 1.399e+01; abs: 6.783e-03; rel: 4.848e-04; norm: 1.034e+00; mom: 1.341e-01;

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## best it: 91; best obj: 1.399e+01
## It: 92; obj: 1.398e+01; abs: 6.122e-03; rel: 4.377e-04; norm: 1.033e+00; mom: 1.301e-01;
## best it: 92; best obj: 1.398e+01
## It: 93; obj: 1.397e+01; abs: 5.597e-03; rel: 4.004e-04; norm: 1.031e+00; mom: 1.258e-01;
## best it: 93; best obj: 1.397e+01
## It: 94; obj: 1.397e+01; abs: 5.294e-03; rel: 3.789e-04; norm: 1.030e+00; mom: 1.222e-01;
## best it: 94; best obj: 1.397e+01
## It: 95; obj: 1.396e+01; abs: 5.235e-03; rel: 3.748e-04; norm: 1.028e+00; mom: 1.203e-01;
## best it: 95; best obj: 1.396e+01
## It: 96; obj: 1.396e+01; abs: 5.412e-03; rel: 3.876e-04; norm: 1.027e+00; mom: 1.205e-01;
## best it: 96; best obj: 1.396e+01
## It: 97; obj: 1.395e+01; abs: 5.799e-03; rel: 4.155e-04; norm: 1.025e+00; mom: 1.228e-01;
## best it: 97; best obj: 1.395e+01
## It: 98; obj: 1.395e+01; abs: 6.358e-03; rel: 4.557e-04; norm: 1.024e+00; mom: 1.270e-01;
## best it: 98; best obj: 1.395e+01
## It: 99; obj: 1.394e+01; abs: 7.020e-03; rel: 5.034e-04; norm: 1.022e+00; mom: 1.327e-01;
## best it: 99; best obj: 1.394e+01
## It: 100; obj: 1.393e+01; abs: 7.671e-03; rel: 5.504e-04; norm: 1.021e+00; mom: 1.393e-01;
## best it: 100; best obj: 1.393e+01

## It: 101; obj: 2.062e+00; abs: 1.187e+01; rel: 8.520e-01; norm: 1.227e-01; mom: 1.460e-01;
## best it: 101; best obj: 2.062e+00
## It: 102; obj: 2.041e+00; abs: 2.015e-02; rel: 9.772e-03; norm: 1.264e-01; mom: 1.575e+00;
## best it: 102; best obj: 2.041e+00
## It: 103; obj: 2.035e+00; abs: 6.279e-03; rel: 3.076e-03; norm: 1.283e-01; mom: 1.016e+00;
## best it: 103; best obj: 2.035e+00
## It: 104; obj: 2.024e+00; abs: 1.150e-02; rel: 5.652e-03; norm: 1.294e-01; mom: 1.116e+00;
## best it: 104; best obj: 2.024e+00
## It: 105; obj: 2.021e+00; abs: 2.290e-03; rel: 1.132e-03; norm: 1.298e-01; mom: 1.391e+00;
## best it: 105; best obj: 2.021e+00
## It: 106; obj: 2.020e+00; abs: 1.011e-03; rel: 5.003e-04; norm: 1.299e-01; mom: 4.810e-01;
## best it: 106; best obj: 2.020e+00
## It: 107; obj: 2.021e+00; abs: 2.202e-04; rel: 1.090e-04; norm: 1.302e-01; mom: 6.663e-01;
## best it: 106; best obj: 2.020e+00
## It: 108; obj: 2.019e+00; abs: 1.217e-03; rel: 6.024e-04; norm: 1.297e-01; mom: 1.014e+00;
## best it: 108; best obj: 2.019e+00
## It: 109; obj: 2.017e+00; abs: 2.386e-03; rel: 1.182e-03; norm: 1.293e-01; mom: 4.595e-01;
## best it: 109; best obj: 2.017e+00
## It: 110; obj: 2.016e+00; abs: 8.061e-04; rel: 3.997e-04; norm: 1.292e-01; mom: 9.286e-01;
## best it: 110; best obj: 2.016e+00
## It: 111; obj: 2.016e+00; abs: 2.108e-04; rel: 1.045e-04; norm: 1.293e-01; mom: 3.243e-01;
## best it: 110; best obj: 2.016e+00
## It: 112; obj: 2.015e+00; abs: 1.057e-03; rel: 5.243e-04; norm: 1.289e-01; mom: 5.652e-01;
## best it: 112; best obj: 2.015e+00
## It: 113; obj: 2.015e+00; abs: 2.168e-04; rel: 1.076e-04; norm: 1.290e-01; mom: 4.359e-01;
## best it: 112; best obj: 2.015e+00
## It: 114; obj: 2.016e+00; abs: 2.974e-04; rel: 1.476e-04; norm: 1.294e-01; mom: 8.135e-01;
## best it: 112; best obj: 2.015e+00
## It: 115; obj: 2.013e+00; abs: 2.386e-03; rel: 1.183e-03; norm: 1.293e-01; mom: 4.577e-01;
## best it: 115; best obj: 2.013e+00
## It: 116; obj: 2.011e+00; abs: 2.722e-03; rel: 1.352e-03; norm: 1.294e-01; mom: 1.049e+00;
## best it: 116; best obj: 2.011e+00
## It: 117; obj: 2.010e+00; abs: 9.426e-04; rel: 4.688e-04; norm: 1.295e-01; mom: 2.911e-01;
## best it: 117; best obj: 2.010e+00

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## It: 118; obj: 2.009e+00; abs: 7.598e-04; rel: 3.781e-04; norm: 1.299e-01; mom: 6.468e-01;
## best it: 118; best obj: 2.009e+00
## It: 119; obj: 2.009e+00; abs: 1.223e-04; rel: 6.086e-05; norm: 1.301e-01; mom: 1.893e-01;
## best it: 119; best obj: 2.009e+00
## It: 120; obj: 2.008e+00; abs: 1.167e-03; rel: 5.809e-04; norm: 1.301e-01; mom: 9.535e-01;
## best it: 120; best obj: 2.008e+00
## It: 121; obj: 2.006e+00; abs: 2.193e-03; rel: 1.092e-03; norm: 1.302e-01; mom: 2.036e-01;
## best it: 121; best obj: 2.006e+00
## It: 122; obj: 2.003e+00; abs: 2.969e-03; rel: 1.480e-03; norm: 1.305e-01; mom: 1.004e+00;
## best it: 122; best obj: 2.003e+00
## It: 123; obj: 2.000e+00; abs: 2.625e-03; rel: 1.311e-03; norm: 1.310e-01; mom: 2.895e-01;
## best it: 123; best obj: 2.000e+00
## It: 124; obj: 1.996e+00; abs: 4.164e-03; rel: 2.082e-03; norm: 1.312e-01; mom: 8.822e-01;
## best it: 124; best obj: 1.996e+00
## It: 125; obj: 1.990e+00; abs: 5.728e-03; rel: 2.870e-03; norm: 1.319e-01; mom: 3.598e-01;
## best it: 125; best obj: 1.990e+00

## It: 126; obj: 1.983e+00; abs: 7.229e-03; rel: 3.632e-03; norm: 1.325e-01; mom: 1.022e+00;
## best it: 126; best obj: 1.983e+00
## It: 127; obj: 1.979e+00; abs: 3.624e-03; rel: 1.828e-03; norm: 1.329e-01; mom: 4.958e-01;
## best it: 127; best obj: 1.979e+00
## It: 128; obj: 1.978e+00; abs: 9.673e-04; rel: 4.887e-04; norm: 1.328e-01; mom: 6.957e-01;
## best it: 128; best obj: 1.978e+00
## It: 129; obj: 1.978e+00; abs: 2.337e-04; rel: 1.181e-04; norm: 1.328e-01; mom: 1.873e-01;
## best it: 128; best obj: 1.978e+00
## It: 130; obj: 1.978e+00; abs: 1.714e-04; rel: 8.663e-05; norm: 1.329e-01; mom: 7.428e-01;
## best it: 128; best obj: 1.978e+00
## It: 131; obj: 1.977e+00; abs: 1.322e-03; rel: 6.683e-04; norm: 1.328e-01; mom: 7.547e-02;
## best it: 131; best obj: 1.977e+00
## It: 132; obj: 1.977e+00; abs: 3.597e-04; rel: 1.820e-04; norm: 1.327e-01; mom: 5.732e-01;
## best it: 131; best obj: 1.977e+00
## It: 133; obj: 1.977e+00; abs: 3.569e-04; rel: 1.805e-04; norm: 1.327e-01; mom: 1.671e-01;
## best it: 131; best obj: 1.977e+00
## It: 134; obj: 1.977e+00; abs: 1.293e-04; rel: 6.541e-05; norm: 1.327e-01; mom: 4.145e-01;
## best it: 131; best obj: 1.977e+00
## It: 135; obj: 1.977e+00; abs: 3.146e-04; rel: 1.591e-04; norm: 1.327e-01; mom: 8.579e-02;
## best it: 135; best obj: 1.977e+00
## It: 136; obj: 1.977e+00; abs: 1.516e-04; rel: 7.668e-05; norm: 1.327e-01; mom: 3.257e-01;
## best it: 135; best obj: 1.977e+00
## It: 137; obj: 1.977e+00; abs: 2.584e-04; rel: 1.307e-04; norm: 1.327e-01; mom: 1.033e-01;
## best it: 137; best obj: 1.977e+00
## It: 138; obj: 1.977e+00; abs: 1.111e-04; rel: 5.621e-05; norm: 1.327e-01; mom: 2.439e-01;
## best it: 137; best obj: 1.977e+00
## It: 139; obj: 1.977e+00; abs: 1.675e-04; rel: 8.475e-05; norm: 1.327e-01; mom: 8.986e-02;
## best it: 139; best obj: 1.977e+00
## It: 140; obj: 1.977e+00; abs: 7.389e-05; rel: 3.738e-05; norm: 1.327e-01; mom: 1.614e-01;
## best it: 139; best obj: 1.977e+00
## It: 141; obj: 1.977e+00; abs: 1.001e-04; rel: 5.063e-05; norm: 1.327e-01; mom: 9.505e-02;
## best it: 141; best obj: 1.977e+00
## It: 142; obj: 1.977e+00; abs: 3.780e-05; rel: 1.912e-05; norm: 1.327e-01; mom: 9.294e-02;
## best it: 141; best obj: 1.977e+00
## It: 143; obj: 1.977e+00; abs: 4.264e-05; rel: 2.157e-05; norm: 1.326e-01; mom: 8.287e-02;
## best it: 143; best obj: 1.977e+00
## It: 144; obj: 1.977e+00; abs: 1.384e-05; rel: 7.001e-06; norm: 1.326e-01; mom: 4.917e-02;

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## best it: 143; best obj: 1.977e+00
## It: 145; obj: 1.977e+00; abs: 1.824e-05; rel: 9.230e-06; norm: 1.326e-01; mom: 7.540e-02;
## best it: 145; best obj: 1.977e+00
## It: 146; obj: 1.977e+00; abs: 1.463e-06; rel: 7.400e-07; norm: 1.326e-01; mom: 2.287e-02;
## best it: 145; best obj: 1.977e+00
## It: 147; obj: 1.977e+00; abs: 4.793e-06; rel: 2.425e-06; norm: 1.326e-01; mom: 5.885e-02;
## best it: 147; best obj: 1.977e+00
## It: 148; obj: 1.977e+00; abs: 4.662e-07; rel: 2.359e-07; norm: 1.326e-01; mom: 1.187e-02;
## best it: 148; best obj: 1.977e+00
## It: 149; obj: 1.977e+00; abs: 3.244e-06; rel: 1.641e-06; norm: 1.326e-01; mom: 5.114e-02;
## best it: 149; best obj: 1.977e+00
## It: 150; obj: 1.977e+00; abs: 7.963e-07; rel: 4.029e-07; norm: 1.326e-01; mom: 1.421e-02;
## best it: 150; best obj: 1.977e+00

## It: 151; obj: 1.977e+00; abs: 1.697e-06; rel: 8.584e-07; norm: 1.326e-01; mom: 3.978e-02;
## best it: 151; best obj: 1.977e+00
## It: 152; obj: 1.977e+00; abs: 6.492e-07; rel: 3.284e-07; norm: 1.326e-01; mom: 1.310e-02;
## best it: 151; best obj: 1.977e+00
## It: 153; obj: 1.977e+00; abs: 2.627e-06; rel: 1.329e-06; norm: 1.326e-01; mom: 3.616e-02;
## best it: 153; best obj: 1.977e+00
## It: 154; obj: 1.977e+00; abs: 9.966e-07; rel: 5.042e-07; norm: 1.326e-01; mom: 1.397e-02;
## best it: 153; best obj: 1.977e+00
## It: 155; obj: 1.977e+00; abs: 2.150e-06; rel: 1.088e-06; norm: 1.326e-01; mom: 2.990e-02;
## best it: 155; best obj: 1.977e+00
## It: 156; obj: 1.977e+00; abs: 1.603e-06; rel: 8.108e-07; norm: 1.326e-01; mom: 1.180e-02;
## best it: 155; best obj: 1.977e+00
## It: 157; obj: 1.977e+00; abs: 2.459e-06; rel: 1.244e-06; norm: 1.326e-01; mom: 2.815e-02;
## best it: 157; best obj: 1.977e+00
## It: 158; obj: 1.977e+00; abs: 1.471e-06; rel: 7.440e-07; norm: 1.326e-01; mom: 1.173e-02;
## best it: 157; best obj: 1.977e+00
## It: 159; obj: 1.977e+00; abs: 1.977e-06; rel: 1.000e-06; norm: 1.326e-01; mom: 2.416e-02;
## best it: 159; best obj: 1.977e+00
## It: 160; obj: 1.977e+00; abs: 1.584e-06; rel: 8.013e-07; norm: 1.326e-01; mom: 1.008e-02;
## best it: 159; best obj: 1.977e+00
## It: 161; obj: 1.977e+00; abs: 1.964e-06; rel: 9.935e-07; norm: 1.326e-01; mom: 2.276e-02;
## best it: 161; best obj: 1.977e+00
## It: 162; obj: 1.977e+00; abs: 1.331e-06; rel: 6.736e-07; norm: 1.326e-01; mom: 1.034e-02;
## best it: 161; best obj: 1.977e+00
## It: 163; obj: 1.977e+00; abs: 1.585e-06; rel: 8.017e-07; norm: 1.326e-01; mom: 1.979e-02;
## best it: 163; best obj: 1.977e+00
## It: 164; obj: 1.977e+00; abs: 1.303e-06; rel: 6.594e-07; norm: 1.326e-01; mom: 9.417e-03;
## best it: 163; best obj: 1.977e+00
## It: 165; obj: 1.977e+00; abs: 1.484e-06; rel: 7.507e-07; norm: 1.326e-01; mom: 1.845e-02;
## best it: 165; best obj: 1.977e+00
## It: 166; obj: 1.977e+00; abs: 1.074e-06; rel: 5.432e-07; norm: 1.326e-01; mom: 9.775e-03;
## best it: 165; best obj: 1.977e+00
## It: 167; obj: 1.977e+00; abs: 1.215e-06; rel: 6.145e-07; norm: 1.326e-01; mom: 1.614e-02;
## best it: 167; best obj: 1.977e+00
## It: 168; obj: 1.977e+00; abs: 1.006e-06; rel: 5.092e-07; norm: 1.326e-01; mom: 9.204e-03;
## best it: 167; best obj: 1.977e+00
## It: 169; obj: 1.977e+00; abs: 1.095e-06; rel: 5.538e-07; norm: 1.326e-01; mom: 1.489e-02;
## best it: 169; best obj: 1.977e+00
## It: 170; obj: 1.977e+00; abs: 8.212e-07; rel: 4.155e-07; norm: 1.326e-01; mom: 9.407e-03;
## best it: 169; best obj: 1.977e+00

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## It: 171; obj: 1.977e+00; abs: 9.034e-07; rel: 4.571e-07; norm: 1.326e-01; mom: 1.307e-02;
## best it: 171; best obj: 1.977e+00
## It: 172; obj: 1.977e+00; abs: 7.438e-07; rel: 3.763e-07; norm: 1.326e-01; mom: 8.967e-03;
## best it: 171; best obj: 1.977e+00
## It: 173; obj: 1.977e+00; abs: 7.878e-07; rel: 3.986e-07; norm: 1.326e-01; mom: 1.193e-02;
## best it: 173; best obj: 1.977e+00
## It: 174; obj: 1.977e+00; abs: 6.014e-07; rel: 3.043e-07; norm: 1.326e-01; mom: 8.973e-03;
## best it: 173; best obj: 1.977e+00
## It: 175; obj: 1.977e+00; abs: 6.504e-07; rel: 3.291e-07; norm: 1.326e-01; mom: 1.048e-02;
## best it: 175; best obj: 1.977e+00

## It: 176; obj: 1.977e+00; abs: 5.271e-07; rel: 2.667e-07; norm: 1.326e-01; mom: 8.584e-03;
## best it: 175; best obj: 1.977e+00
## It: 177; obj: 1.977e+00; abs: 5.502e-07; rel: 2.784e-07; norm: 1.326e-01; mom: 9.454e-03;
## best it: 177; best obj: 1.977e+00
## It: 178; obj: 1.977e+00; abs: 4.217e-07; rel: 2.133e-07; norm: 1.326e-01; mom: 8.433e-03;
## best it: 177; best obj: 1.977e+00
## It: 179; obj: 1.977e+00; abs: 4.514e-07; rel: 2.284e-07; norm: 1.326e-01; mom: 8.307e-03;
## best it: 179; best obj: 1.977e+00
## It: 180; obj: 1.977e+00; abs: 3.573e-07; rel: 1.808e-07; norm: 1.326e-01; mom: 8.069e-03;
## best it: 179; best obj: 1.977e+00
## It: 181; obj: 1.977e+00; abs: 3.708e-07; rel: 1.876e-07; norm: 1.326e-01; mom: 7.402e-03;
## best it: 181; best obj: 1.977e+00
## It: 182; obj: 1.977e+00; abs: 2.819e-07; rel: 1.426e-07; norm: 1.326e-01; mom: 7.811e-03;
## best it: 181; best obj: 1.977e+00
## It: 183; obj: 1.977e+00; abs: 3.004e-07; rel: 1.520e-07; norm: 1.326e-01; mom: 6.489e-03;
## best it: 183; best obj: 1.977e+00
## It: 184; obj: 1.977e+00; abs: 2.301e-07; rel: 1.164e-07; norm: 1.326e-01; mom: 7.463e-03;
## best it: 183; best obj: 1.977e+00
## It: 185; obj: 1.977e+00; abs: 2.395e-07; rel: 1.212e-07; norm: 1.326e-01; mom: 5.709e-03;
## best it: 185; best obj: 1.977e+00
## It: 186; obj: 1.977e+00; abs: 1.780e-07; rel: 9.004e-08; norm: 1.326e-01; mom: 7.141e-03;
## best it: 185; best obj: 1.977e+00
## It: 187; obj: 1.977e+00; abs: 1.901e-07; rel: 9.620e-08; norm: 1.326e-01; mom: 4.984e-03;
## best it: 187; best obj: 1.977e+00
## It: 188; obj: 1.977e+00; abs: 1.388e-07; rel: 7.020e-08; norm: 1.326e-01; mom: 6.805e-03;
## best it: 187; best obj: 1.977e+00
## It: 189; obj: 1.977e+00; abs: 1.463e-07; rel: 7.402e-08; norm: 1.326e-01; mom: 4.329e-03;
## best it: 189; best obj: 1.977e+00
## It: 190; obj: 1.977e+00; abs: 1.039e-07; rel: 5.259e-08; norm: 1.326e-01; mom: 6.452e-03;
## best it: 189; best obj: 1.977e+00
## It: 191; obj: 1.977e+00; abs: 1.125e-07; rel: 5.694e-08; norm: 1.326e-01; mom: 3.758e-03;
## best it: 191; best obj: 1.977e+00
## It: 192; obj: 1.977e+00; abs: 7.582e-08; rel: 3.836e-08; norm: 1.326e-01; mom: 6.128e-03;
## best it: 191; best obj: 1.977e+00
## It: 193; obj: 1.977e+00; abs: 8.253e-08; rel: 4.175e-08; norm: 1.326e-01; mom: 3.221e-03;
## best it: 193; best obj: 1.977e+00
## It: 194; obj: 1.977e+00; abs: 5.355e-08; rel: 2.709e-08; norm: 1.326e-01; mom: 5.767e-03;
## best it: 193; best obj: 1.977e+00
## It: 195; obj: 1.977e+00; abs: 6.014e-08; rel: 3.043e-08; norm: 1.326e-01; mom: 2.776e-03;
## best it: 195; best obj: 1.977e+00
## It: 196; obj: 1.977e+00; abs: 3.447e-08; rel: 1.744e-08; norm: 1.326e-01; mom: 5.456e-03;
## best it: 195; best obj: 1.977e+00
## It: 197; obj: 1.977e+00; abs: 4.062e-08; rel: 2.055e-08; norm: 1.326e-01; mom: 2.351e-03;

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## best it: 197; best obj: 1.977e+00
## It: 198; obj: 1.977e+00; abs: 2.096e-08; rel: 1.061e-08; norm: 1.326e-01; mom: 5.103e-03;
## best it: 197; best obj: 1.977e+00
## It: 199; obj: 1.977e+00; abs: 2.638e-08; rel: 1.335e-08; norm: 1.326e-01; mom: 2.012e-03;
## best it: 199; best obj: 1.977e+00
## It: 200; obj: 1.977e+00; abs: 8.833e-09; rel: 4.469e-09; norm: 1.326e-01; mom: 4.808e-03;
## best it: 199; best obj: 1.977e+00

## It: 201; obj: 1.977e+00; abs: 1.445e-08; rel: 7.310e-09; norm: 1.326e-01; mom: 1.692e-03;
## best it: 201; best obj: 1.977e+00
## It: 202; obj: 1.977e+00; abs: 1.264e-09; rel: 6.394e-10; norm: 1.326e-01; mom: 4.474e-03;
## best it: 201; best obj: 1.977e+00
## It: 203; obj: 1.977e+00; abs: 5.917e-09; rel: 2.993e-09; norm: 1.326e-01; mom: 1.444e-03;
## best it: 203; best obj: 1.977e+00
## It: 204; obj: 1.977e+00; abs: 5.824e-09; rel: 2.946e-09; norm: 1.326e-01; mom: 4.196e-03;
## best it: 204; best obj: 1.977e+00
## It: 205; obj: 1.977e+00; abs: 7.868e-10; rel: 3.981e-10; norm: 1.326e-01; mom: 1.222e-03;
## best it: 204; best obj: 1.977e+00
## It: 206; obj: 1.977e+00; abs: 9.512e-09; rel: 4.812e-09; norm: 1.326e-01; mom: 3.886e-03;
## best it: 206; best obj: 1.977e+00
## It: 207; obj: 1.977e+00; abs: 5.449e-09; rel: 2.757e-09; norm: 1.326e-01; mom: 1.058e-03;
## best it: 206; best obj: 1.977e+00
## It: 208; obj: 1.977e+00; abs: 1.313e-08; rel: 6.643e-09; norm: 1.326e-01; mom: 3.627e-03;
## best it: 208; best obj: 1.977e+00
## It: 209; obj: 1.977e+00; abs: 8.716e-09; rel: 4.410e-09; norm: 1.326e-01; mom: 9.274e-04;
## best it: 208; best obj: 1.977e+00
## It: 210; obj: 1.977e+00; abs: 1.440e-08; rel: 7.285e-09; norm: 1.326e-01; mom: 3.345e-03;
## best it: 210; best obj: 1.977e+00
## It: 211; obj: 1.977e+00; abs: 1.086e-08; rel: 5.493e-09; norm: 1.326e-01; mom: 8.363e-04;
## best it: 210; best obj: 1.977e+00
## It: 212; obj: 1.977e+00; abs: 1.577e-08; rel: 7.977e-09; norm: 1.326e-01; mom: 3.108e-03;
## best it: 212; best obj: 1.977e+00
## It: 213; obj: 1.977e+00; abs: 1.199e-08; rel: 6.066e-09; norm: 1.326e-01; mom: 7.832e-04;
## best it: 212; best obj: 1.977e+00
## It: 214; obj: 1.977e+00; abs: 1.562e-08; rel: 7.904e-09; norm: 1.326e-01; mom: 2.855e-03;
## best it: 214; best obj: 1.977e+00
## It: 215; obj: 1.977e+00; abs: 1.257e-08; rel: 6.361e-09; norm: 1.326e-01; mom: 7.466e-04;
## best it: 214; best obj: 1.977e+00
## It: 216; obj: 1.977e+00; abs: 1.564e-08; rel: 7.911e-09; norm: 1.326e-01; mom: 2.639e-03;
## best it: 216; best obj: 1.977e+00
## It: 217; obj: 1.977e+00; abs: 1.248e-08; rel: 6.312e-09; norm: 1.326e-01; mom: 7.408e-04;
## best it: 216; best obj: 1.977e+00
## It: 218; obj: 1.977e+00; abs: 1.475e-08; rel: 7.463e-09; norm: 1.326e-01; mom: 2.414e-03;
## best it: 218; best obj: 1.977e+00
## It: 219; obj: 1.977e+00; abs: 1.217e-08; rel: 6.157e-09; norm: 1.326e-01; mom: 7.327e-04;
## best it: 218; best obj: 1.977e+00
## It: 220; obj: 1.977e+00; abs: 1.403e-08; rel: 7.100e-09; norm: 1.326e-01; mom: 2.221e-03;
## best it: 220; best obj: 1.977e+00
## It: 221; obj: 1.977e+00; abs: 1.144e-08; rel: 5.789e-09; norm: 1.326e-01; mom: 7.441e-04;
## best it: 220; best obj: 1.977e+00
## It: 222; obj: 1.977e+00; abs: 1.283e-08; rel: 6.494e-09; norm: 1.326e-01; mom: 2.024e-03;
## best it: 222; best obj: 1.977e+00
## It: 223; obj: 1.977e+00; abs: 1.069e-08; rel: 5.411e-09; norm: 1.326e-01; mom: 7.441e-04;
## best it: 222; best obj: 1.977e+00

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## It: 224; obj: 1.977e+00; abs: 1.180e-08; rel: 5.969e-09; norm: 1.326e-01; mom: 1.852e-03;
## best it: 224; best obj: 1.977e+00
## It: 225; obj: 1.977e+00; abs: 9.715e-09; rel: 4.915e-09; norm: 1.326e-01; mom: 7.549e-04;
## best it: 224; best obj: 1.977e+00

## It: 226; obj: 1.977e+00; abs: 1.055e-08; rel: 5.336e-09; norm: 1.326e-01; mom: 1.681e-03;
## best it: 226; best obj: 1.977e+00
## It: 227; obj: 1.977e+00; abs: 8.808e-09; rel: 4.456e-09; norm: 1.326e-01; mom: 7.528e-04;
## best it: 226; best obj: 1.977e+00
## It: 228; obj: 1.977e+00; abs: 9.444e-09; rel: 4.778e-09; norm: 1.326e-01; mom: 1.530e-03;
## best it: 228; best obj: 1.977e+00
## It: 229; obj: 1.977e+00; abs: 7.798e-09; rel: 3.945e-09; norm: 1.326e-01; mom: 7.561e-04;
## best it: 228; best obj: 1.977e+00
## It: 230; obj: 1.977e+00; abs: 8.284e-09; rel: 4.191e-09; norm: 1.326e-01; mom: 1.382e-03;
## best it: 230; best obj: 1.977e+00
## It: 231; obj: 1.977e+00; abs: 6.898e-09; rel: 3.490e-09; norm: 1.326e-01; mom: 7.484e-04;
## best it: 230; best obj: 1.977e+00
## It: 232; obj: 1.977e+00; abs: 7.257e-09; rel: 3.671e-09; norm: 1.326e-01; mom: 1.251e-03;
## best it: 232; best obj: 1.977e+00
## It: 233; obj: 1.977e+00; abs: 5.979e-09; rel: 3.025e-09; norm: 1.326e-01; mom: 7.430e-04;
## best it: 232; best obj: 1.977e+00
## It: 234; obj: 1.977e+00; abs: 6.257e-09; rel: 3.166e-09; norm: 1.326e-01; mom: 1.125e-03;
## best it: 234; best obj: 1.977e+00
## It: 235; obj: 1.977e+00; abs: 5.175e-09; rel: 2.618e-09; norm: 1.326e-01; mom: 7.292e-04;
## best it: 234; best obj: 1.977e+00
## It: 236; obj: 1.977e+00; abs: 5.374e-09; rel: 2.719e-09; norm: 1.326e-01; mom: 1.012e-03;
## best it: 236; best obj: 1.977e+00
## It: 237; obj: 1.977e+00; abs: 4.398e-09; rel: 2.225e-09; norm: 1.326e-01; mom: 7.161e-04;
## best it: 236; best obj: 1.977e+00
## It: 238; obj: 1.977e+00; abs: 4.558e-09; rel: 2.306e-09; norm: 1.326e-01; mom: 9.048e-04;
## best it: 238; best obj: 1.977e+00
## It: 239; obj: 1.977e+00; abs: 3.728e-09; rel: 1.886e-09; norm: 1.326e-01; mom: 6.973e-04;
## best it: 238; best obj: 1.977e+00
## It: 240; obj: 1.977e+00; abs: 3.841e-09; rel: 1.943e-09; norm: 1.326e-01; mom: 8.087e-04;
## best it: 240; best obj: 1.977e+00
## It: 241; obj: 1.977e+00; abs: 3.107e-09; rel: 1.572e-09; norm: 1.326e-01; mom: 6.782e-04;
## best it: 240; best obj: 1.977e+00
## It: 242; obj: 1.977e+00; abs: 3.201e-09; rel: 1.619e-09; norm: 1.326e-01; mom: 7.190e-04;
## best it: 242; best obj: 1.977e+00
## It: 243; obj: 1.977e+00; abs: 2.576e-09; rel: 1.303e-09; norm: 1.326e-01; mom: 6.555e-04;
## best it: 242; best obj: 1.977e+00
## It: 244; obj: 1.977e+00; abs: 2.644e-09; rel: 1.338e-09; norm: 1.326e-01; mom: 6.381e-04;
## best it: 244; best obj: 1.977e+00
## It: 245; obj: 1.977e+00; abs: 2.101e-09; rel: 1.063e-09; norm: 1.326e-01; mom: 6.324e-04;
## best it: 244; best obj: 1.977e+00
## It: 246; obj: 1.977e+00; abs: 2.161e-09; rel: 1.093e-09; norm: 1.326e-01; mom: 5.636e-04;
## best it: 246; best obj: 1.977e+00
## It: 247; obj: 1.977e+00; abs: 1.699e-09; rel: 8.597e-10; norm: 1.326e-01; mom: 6.072e-04;
## best it: 246; best obj: 1.977e+00
## It: 248; obj: 1.977e+00; abs: 1.378e-09; rel: 6.973e-10; norm: 1.326e-01; mom: 7.939e-04;
## best it: 246; best obj: 1.977e+00
## It: 249; obj: 1.977e+00; abs: 3.107e-09; rel: 1.572e-09; norm: 1.326e-01; mom: 3.811e-04;
## best it: 246; best obj: 1.977e+00
## It: 250; obj: 1.977e+00; abs: 3.631e-09; rel: 1.837e-09; norm: 1.326e-01; mom: 1.466e-03;

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## best it: 246; best obj: 1.977e+00
## It: 251; obj: 1.977e+00; abs: 4.472e-09; rel: 2.262e-09; norm: 1.326e-01; mom: 7.749e-04;
## best it: 246; best obj: 1.977e+00
## It: 252; obj: 1.977e+00; abs: 2.648e-08; rel: 1.340e-08; norm: 1.326e-01; mom: 1.967e-03;
## best it: 246; best obj: 1.977e+00
## It: 253; obj: 1.977e+00; abs: 2.052e-08; rel: 1.038e-08; norm: 1.326e-01; mom: 2.621e-03;
## best it: 246; best obj: 1.977e+00
## It: 254; obj: 1.977e+00; abs: 5.037e-08; rel: 2.548e-08; norm: 1.326e-01; mom: 1.546e-03;
## best it: 246; best obj: 1.977e+00
## It: 255; obj: 1.977e+00; abs: 3.088e-08; rel: 1.562e-08; norm: 1.326e-01; mom: 5.290e-03;
## best it: 246; best obj: 1.977e+00
## It: 256; obj: 1.977e+00; abs: 3.645e-08; rel: 1.844e-08; norm: 1.326e-01; mom: 2.347e-03;
## best it: 246; best obj: 1.977e+00
## It: 257; obj: 1.977e+00; abs: 3.305e-07; rel: 1.672e-07; norm: 1.326e-01; mom: 7.543e-03;
## best it: 246; best obj: 1.977e+00
## It: 258; obj: 1.977e+00; abs: 2.910e-07; rel: 1.472e-07; norm: 1.326e-01; mom: 8.845e-03;
## best it: 246; best obj: 1.977e+00
## It: 259; obj: 1.977e+00; abs: 7.519e-07; rel: 3.804e-07; norm: 1.326e-01; mom: 6.689e-03;
## best it: 246; best obj: 1.977e+00
## It: 260; obj: 1.977e+00; abs: 2.137e-07; rel: 1.081e-07; norm: 1.326e-01; mom: 1.888e-02;
## best it: 246; best obj: 1.977e+00
## It: 261; obj: 1.977e+00; abs: 1.768e-07; rel: 8.945e-08; norm: 1.326e-01; mom: 7.083e-03;
## best it: 246; best obj: 1.977e+00
## It: 262; obj: 1.977e+00; abs: 4.005e-06; rel: 2.026e-06; norm: 1.326e-01; mom: 2.875e-02;
## best it: 246; best obj: 1.977e+00
## It: 263; obj: 1.977e+00; abs: 3.876e-06; rel: 1.961e-06; norm: 1.326e-01; mom: 2.938e-02;
## best it: 246; best obj: 1.977e+00
## It: 264; obj: 1.977e+00; abs: 1.046e-05; rel: 5.293e-06; norm: 1.326e-01; mom: 2.857e-02;
## best it: 246; best obj: 1.977e+00
## It: 265; obj: 1.977e+00; abs: 2.197e-06; rel: 1.111e-06; norm: 1.326e-01; mom: 6.623e-02;
## best it: 246; best obj: 1.977e+00
## It: 266; obj: 1.977e+00; abs: 3.428e-07; rel: 1.734e-07; norm: 1.326e-01; mom: 2.356e-02;
## best it: 246; best obj: 1.977e+00
## It: 267; obj: 1.977e+00; abs: 4.792e-05; rel: 2.425e-05; norm: 1.326e-01; mom: 1.114e-01;
## best it: 246; best obj: 1.977e+00
## It: 268; obj: 1.977e+00; abs: 4.824e-05; rel: 2.441e-05; norm: 1.326e-01; mom: 9.790e-02;
## best it: 246; best obj: 1.977e+00
## It: 269; obj: 1.977e+00; abs: 1.213e-04; rel: 6.137e-05; norm: 1.326e-01; mom: 1.203e-01;
## best it: 246; best obj: 1.977e+00
## It: 270; obj: 1.977e+00; abs: 2.178e-04; rel: 1.102e-04; norm: 1.325e-01; mom: 2.267e-01;
## best it: 246; best obj: 1.977e+00
## It: 271; obj: 1.978e+00; abs: 6.474e-04; rel: 3.275e-04; norm: 1.325e-01; mom: 2.018e-01;
## best it: 246; best obj: 1.977e+00
## It: 272; obj: 1.979e+00; abs: 1.235e-03; rel: 6.244e-04; norm: 1.327e-01; mom: 9.160e-01;
## best it: 246; best obj: 1.977e+00
## It: 273; obj: 1.978e+00; abs: 4.606e-04; rel: 2.327e-04; norm: 1.327e-01; mom: 5.446e-01;
## best it: 246; best obj: 1.977e+00
## It: 274; obj: 1.978e+00; abs: 2.041e-04; rel: 1.032e-04; norm: 1.327e-01; mom: 1.603e+00;
## best it: 246; best obj: 1.977e+00
## It: 275; obj: 1.978e+00; abs: 3.452e-04; rel: 1.745e-04; norm: 1.327e-01; mom: 1.478e-01;
## best it: 246; best obj: 1.977e+00
## It: 276; obj: 1.978e+00; abs: 2.529e-04; rel: 1.279e-04; norm: 1.327e-01; mom: 1.553e+00;
## best it: 246; best obj: 1.977e+00

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## It: 277; obj: 1.977e+00; abs: 4.683e-04; rel: 2.368e-04; norm: 1.327e-01; mom: 1.527e-01;
## best it: 246; best obj: 1.977e+00
## It: 278; obj: 1.978e+00; abs: 5.608e-04; rel: 2.836e-04; norm: 1.326e-01; mom: 8.434e-01;
## best it: 246; best obj: 1.977e+00
## It: 279; obj: 1.979e+00; abs: 1.829e-03; rel: 9.250e-04; norm: 1.325e-01; mom: 6.882e-01;
## best it: 246; best obj: 1.977e+00
## It: 280; obj: 1.980e+00; abs: 4.716e-04; rel: 2.382e-04; norm: 1.327e-01; mom: 1.215e+00;
## best it: 246; best obj: 1.977e+00
## It: 281; obj: 1.977e+00; abs: 3.212e-03; rel: 1.622e-03; norm: 1.326e-01; mom: 9.397e-01;
## best it: 246; best obj: 1.977e+00
## It: 282; obj: 1.977e+00; abs: 9.005e-05; rel: 4.555e-05; norm: 1.327e-01; mom: 1.366e+00;
## best it: 246; best obj: 1.977e+00
## It: 283; obj: 1.978e+00; abs: 8.202e-04; rel: 4.149e-04; norm: 1.325e-01; mom: 3.979e-01;
## best it: 246; best obj: 1.977e+00
## It: 284; obj: 1.979e+00; abs: 1.874e-03; rel: 9.476e-04; norm: 1.326e-01; mom: 6.636e-01;
## best it: 246; best obj: 1.977e+00
## It: 285; obj: 1.980e+00; abs: 3.000e-04; rel: 1.516e-04; norm: 1.327e-01; mom: 1.206e+00;
## best it: 246; best obj: 1.977e+00
## It: 286; obj: 1.977e+00; abs: 3.100e-03; rel: 1.566e-03; norm: 1.326e-01; mom: 1.029e+00;
## best it: 246; best obj: 1.977e+00
## It: 287; obj: 1.977e+00; abs: 1.918e-04; rel: 9.701e-05; norm: 1.327e-01; mom: 1.287e+00;
## best it: 246; best obj: 1.977e+00
## It: 288; obj: 1.978e+00; abs: 1.001e-03; rel: 5.062e-04; norm: 1.325e-01; mom: 4.464e-01;
## best it: 246; best obj: 1.977e+00
## It: 289; obj: 1.980e+00; abs: 1.658e-03; rel: 8.385e-04; norm: 1.326e-01; mom: 8.110e-01;
## best it: 246; best obj: 1.977e+00
## It: 290; obj: 1.979e+00; abs: 4.383e-04; rel: 2.214e-04; norm: 1.327e-01; mom: 1.066e+00;
## best it: 246; best obj: 1.977e+00
## It: 291; obj: 1.977e+00; abs: 2.386e-03; rel: 1.206e-03; norm: 1.327e-01; mom: 1.292e+00;
## best it: 246; best obj: 1.977e+00
## It: 292; obj: 1.977e+00; abs: 3.890e-04; rel: 1.968e-04; norm: 1.327e-01; mom: 1.006e+00;
## best it: 246; best obj: 1.977e+00
## It: 293; obj: 1.978e+00; abs: 1.177e-03; rel: 5.951e-04; norm: 1.325e-01; mom: 5.764e-01;
## best it: 246; best obj: 1.977e+00
## It: 294; obj: 1.979e+00; abs: 1.193e-03; rel: 6.032e-04; norm: 1.327e-01; mom: 1.059e+00;
## best it: 246; best obj: 1.977e+00
## It: 295; obj: 1.977e+00; abs: 2.095e-03; rel: 1.059e-03; norm: 1.327e-01; mom: 6.693e-01;
## best it: 246; best obj: 1.977e+00
## It: 296; obj: 1.977e+00; abs: 5.731e-04; rel: 2.898e-04; norm: 1.327e-01; mom: 1.555e+00;
## best it: 246; best obj: 1.977e+00
## It: 297; obj: 1.977e+00; abs: 4.275e-04; rel: 2.163e-04; norm: 1.327e-01; mom: 3.313e-01;
## best it: 246; best obj: 1.977e+00
## It: 298; obj: 1.978e+00; abs: 9.958e-04; rel: 5.036e-04; norm: 1.325e-01; mom: 7.392e-01;
## best it: 246; best obj: 1.977e+00
## It: 299; obj: 1.980e+00; abs: 1.411e-03; rel: 7.134e-04; norm: 1.327e-01; mom: 9.754e-01;
## best it: 246; best obj: 1.977e+00
## It: 300; obj: 1.978e+00; abs: 2.088e-03; rel: 1.055e-03; norm: 1.327e-01; mom: 8.198e-01;
## best it: 246; best obj: 1.977e+00

## It: 301; obj: 1.977e+00; abs: 7.426e-04; rel: 3.755e-04; norm: 1.327e-01; mom: 1.507e+00;
## best it: 246; best obj: 1.977e+00
## It: 302; obj: 1.977e+00; abs: 4.509e-04; rel: 2.281e-04; norm: 1.327e-01; mom: 4.244e-01;
## best it: 246; best obj: 1.977e+00
## It: 303; obj: 1.978e+00; abs: 9.875e-04; rel: 4.994e-04; norm: 1.325e-01; mom: 7.398e-01;

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## best it: 246; best obj: 1.977e+00
## It: 304; obj: 1.980e+00; abs: 1.372e-03; rel: 6.934e-04; norm: 1.327e-01; mom: 9.910e-01;
## best it: 246; best obj: 1.977e+00
## It: 305; obj: 1.977e+00; abs: 2.139e-03; rel: 1.080e-03; norm: 1.327e-01; mom: 7.781e-01;
## best it: 246; best obj: 1.977e+00
## It: 306; obj: 1.977e+00; abs: 6.650e-04; rel: 3.363e-04; norm: 1.327e-01; mom: 1.522e+00;
## best it: 246; best obj: 1.977e+00
## It: 307; obj: 1.977e+00; abs: 4.494e-04; rel: 2.273e-04; norm: 1.327e-01; mom: 3.990e-01;
## best it: 246; best obj: 1.977e+00
## It: 308; obj: 1.978e+00; abs: 9.756e-04; rel: 4.934e-04; norm: 1.325e-01; mom: 7.345e-01;
## best it: 246; best obj: 1.977e+00
## It: 309; obj: 1.980e+00; abs: 1.407e-03; rel: 7.110e-04; norm: 1.327e-01; mom: 9.894e-01;
## best it: 246; best obj: 1.977e+00
## It: 310; obj: 1.977e+00; abs: 2.147e-03; rel: 1.085e-03; norm: 1.327e-01; mom: 7.907e-01;
## best it: 246; best obj: 1.977e+00
## It: 311; obj: 1.977e+00; abs: 6.668e-04; rel: 3.372e-04; norm: 1.327e-01; mom: 1.518e+00;
## best it: 246; best obj: 1.977e+00
## It: 312; obj: 1.977e+00; abs: 4.424e-04; rel: 2.238e-04; norm: 1.327e-01; mom: 4.119e-01;
## best it: 246; best obj: 1.977e+00
## It: 313; obj: 1.978e+00; abs: 9.708e-04; rel: 4.910e-04; norm: 1.325e-01; mom: 7.338e-01;
## best it: 246; best obj: 1.977e+00
## It: 314; obj: 1.980e+00; abs: 1.426e-03; rel: 7.206e-04; norm: 1.327e-01; mom: 9.908e-01;
## best it: 246; best obj: 1.977e+00
## It: 315; obj: 1.977e+00; abs: 2.179e-03; rel: 1.100e-03; norm: 1.327e-01; mom: 7.905e-01;
## best it: 246; best obj: 1.977e+00
## It: 316; obj: 1.977e+00; abs: 6.346e-04; rel: 3.209e-04; norm: 1.327e-01; mom: 1.518e+00;
## best it: 246; best obj: 1.977e+00
## It: 317; obj: 1.977e+00; abs: 4.185e-04; rel: 2.117e-04; norm: 1.327e-01; mom: 4.151e-01;
## best it: 246; best obj: 1.977e+00
## It: 318; obj: 1.978e+00; abs: 9.835e-04; rel: 4.974e-04; norm: 1.325e-01; mom: 7.320e-01;
## best it: 246; best obj: 1.977e+00
## It: 319; obj: 1.980e+00; abs: 1.439e-03; rel: 7.273e-04; norm: 1.327e-01; mom: 9.917e-01;
## best it: 246; best obj: 1.977e+00
## It: 320; obj: 1.977e+00; abs: 2.207e-03; rel: 1.115e-03; norm: 1.327e-01; mom: 7.918e-01;
## best it: 246; best obj: 1.977e+00
## It: 321; obj: 1.977e+00; abs: 5.974e-04; rel: 3.021e-04; norm: 1.327e-01; mom: 1.519e+00;
## best it: 246; best obj: 1.977e+00
## It: 322; obj: 1.977e+00; abs: 3.758e-04; rel: 1.901e-04; norm: 1.327e-01; mom: 4.180e-01;
## best it: 246; best obj: 1.977e+00
## It: 323; obj: 1.978e+00; abs: 1.018e-03; rel: 5.149e-04; norm: 1.325e-01; mom: 7.321e-01;
## best it: 246; best obj: 1.977e+00
## It: 324; obj: 1.980e+00; abs: 1.436e-03; rel: 7.259e-04; norm: 1.327e-01; mom: 9.918e-01;
## best it: 246; best obj: 1.977e+00
## It: 325; obj: 1.977e+00; abs: 2.226e-03; rel: 1.125e-03; norm: 1.327e-01; mom: 7.930e-01;
## best it: 246; best obj: 1.977e+00

## It: 326; obj: 1.977e+00; abs: 5.574e-04; rel: 2.819e-04; norm: 1.327e-01; mom: 1.519e+00;
## best it: 246; best obj: 1.977e+00
## It: 327; obj: 1.977e+00; abs: 3.142e-04; rel: 1.589e-04; norm: 1.327e-01; mom: 4.190e-01;
## best it: 246; best obj: 1.977e+00
## It: 328; obj: 1.978e+00; abs: 1.077e-03; rel: 5.449e-04; norm: 1.325e-01; mom: 7.357e-01;
## best it: 246; best obj: 1.977e+00
## It: 329; obj: 1.980e+00; abs: 1.409e-03; rel: 7.123e-04; norm: 1.327e-01; mom: 9.904e-01;
## best it: 246; best obj: 1.977e+00

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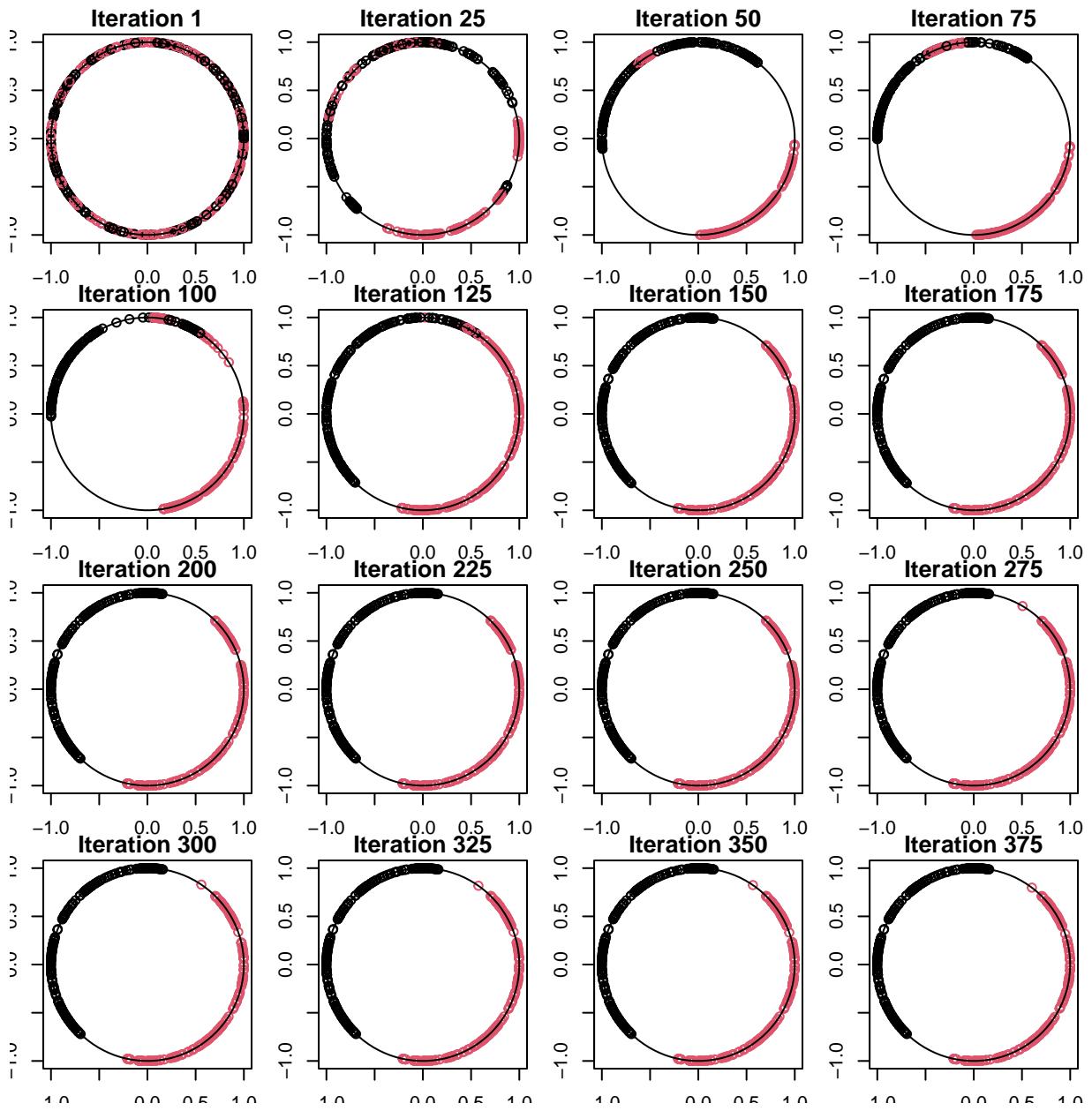
## It: 330; obj: 1.978e+00; abs: 2.222e-03; rel: 1.122e-03; norm: 1.327e-01; mom: 7.950e-01;
## best it: 246; best obj: 1.977e+00
## It: 331; obj: 1.977e+00; abs: 5.257e-04; rel: 2.659e-04; norm: 1.327e-01; mom: 1.520e+00;
## best it: 246; best obj: 1.977e+00
## It: 332; obj: 1.977e+00; abs: 2.413e-04; rel: 1.220e-04; norm: 1.327e-01; mom: 4.185e-01;
## best it: 246; best obj: 1.977e+00
## It: 333; obj: 1.978e+00; abs: 1.158e-03; rel: 5.855e-04; norm: 1.325e-01; mom: 7.457e-01;
## best it: 246; best obj: 1.977e+00
## It: 334; obj: 1.980e+00; abs: 1.350e-03; rel: 6.823e-04; norm: 1.327e-01; mom: 9.872e-01;
## best it: 246; best obj: 1.977e+00
## It: 335; obj: 1.978e+00; abs: 2.180e-03; rel: 1.101e-03; norm: 1.327e-01; mom: 7.992e-01;
## best it: 246; best obj: 1.977e+00
## It: 336; obj: 1.977e+00; abs: 5.171e-04; rel: 2.615e-04; norm: 1.327e-01; mom: 1.522e+00;
## best it: 246; best obj: 1.977e+00
## It: 337; obj: 1.977e+00; abs: 1.780e-04; rel: 9.004e-05; norm: 1.327e-01; mom: 4.174e-01;
## best it: 246; best obj: 1.977e+00
## It: 338; obj: 1.978e+00; abs: 1.246e-03; rel: 6.302e-04; norm: 1.325e-01; mom: 7.653e-01;
## best it: 246; best obj: 1.977e+00
## It: 339; obj: 1.980e+00; abs: 1.252e-03; rel: 6.329e-04; norm: 1.327e-01; mom: 9.822e-01;
## best it: 246; best obj: 1.977e+00
## It: 340; obj: 1.978e+00; abs: 2.090e-03; rel: 1.056e-03; norm: 1.327e-01; mom: 8.077e-01;
## best it: 246; best obj: 1.977e+00
## It: 341; obj: 1.977e+00; abs: 5.512e-04; rel: 2.787e-04; norm: 1.327e-01; mom: 1.523e+00;
## best it: 246; best obj: 1.977e+00
## It: 342; obj: 1.977e+00; abs: 1.613e-04; rel: 8.160e-05; norm: 1.326e-01; mom: 4.166e-01;
## best it: 246; best obj: 1.977e+00
## It: 343; obj: 1.979e+00; abs: 1.318e-03; rel: 6.664e-04; norm: 1.325e-01; mom: 7.945e-01;
## best it: 246; best obj: 1.977e+00
## It: 344; obj: 1.980e+00; abs: 1.126e-03; rel: 5.689e-04; norm: 1.327e-01; mom: 9.768e-01;
## best it: 246; best obj: 1.977e+00
## It: 345; obj: 1.978e+00; abs: 1.960e-03; rel: 9.898e-04; norm: 1.327e-01; mom: 8.235e-01;
## best it: 246; best obj: 1.977e+00
## It: 346; obj: 1.977e+00; abs: 6.510e-04; rel: 3.292e-04; norm: 1.327e-01; mom: 1.524e+00;
## best it: 246; best obj: 1.977e+00
## It: 347; obj: 1.977e+00; abs: 2.253e-04; rel: 1.139e-04; norm: 1.327e-01; mom: 4.165e-01;
## best it: 246; best obj: 1.977e+00
## It: 348; obj: 1.979e+00; abs: 1.342e-03; rel: 6.789e-04; norm: 1.325e-01; mom: 8.238e-01;
## best it: 246; best obj: 1.977e+00
## It: 349; obj: 1.980e+00; abs: 1.016e-03; rel: 5.133e-04; norm: 1.327e-01; mom: 9.728e-01;
## best it: 246; best obj: 1.977e+00
## It: 350; obj: 1.978e+00; abs: 1.818e-03; rel: 9.186e-04; norm: 1.327e-01; mom: 8.474e-01;
## best it: 246; best obj: 1.977e+00
## It: 351; obj: 1.977e+00; abs: 8.290e-04; rel: 4.192e-04; norm: 1.327e-01; mom: 1.525e+00;
## best it: 246; best obj: 1.977e+00
## It: 352; obj: 1.977e+00; abs: 3.696e-04; rel: 1.869e-04; norm: 1.327e-01; mom: 4.186e-01;
## best it: 246; best obj: 1.977e+00
## It: 353; obj: 1.979e+00; abs: 1.299e-03; rel: 6.569e-04; norm: 1.325e-01; mom: 8.378e-01;
## best it: 246; best obj: 1.977e+00
## It: 354; obj: 1.980e+00; abs: 9.890e-04; rel: 4.998e-04; norm: 1.327e-01; mom: 9.707e-01;
## best it: 246; best obj: 1.977e+00
## It: 355; obj: 1.978e+00; abs: 1.709e-03; rel: 8.633e-04; norm: 1.327e-01; mom: 8.729e-01;
## best it: 246; best obj: 1.977e+00
## It: 356; obj: 1.977e+00; abs: 1.060e-03; rel: 5.358e-04; norm: 1.327e-01; mom: 1.525e+00;

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## best it: 246; best obj: 1.977e+00
## It: 357; obj: 1.977e+00; abs: 5.763e-04; rel: 2.915e-04; norm: 1.327e-01; mom: 4.303e-01;
## best it: 246; best obj: 1.977e+00
## It: 358; obj: 1.979e+00; abs: 1.150e-03; rel: 5.815e-04; norm: 1.325e-01; mom: 8.290e-01;
## best it: 246; best obj: 1.977e+00
## It: 359; obj: 1.980e+00; abs: 1.108e-03; rel: 5.599e-04; norm: 1.327e-01; mom: 9.702e-01;
## best it: 246; best obj: 1.977e+00
## It: 360; obj: 1.978e+00; abs: 1.670e-03; rel: 8.436e-04; norm: 1.327e-01; mom: 8.878e-01;
## best it: 246; best obj: 1.977e+00
## It: 361; obj: 1.977e+00; abs: 1.227e-03; rel: 6.202e-04; norm: 1.327e-01; mom: 1.523e+00;
## best it: 246; best obj: 1.977e+00
## It: 362; obj: 1.978e+00; abs: 8.205e-04; rel: 4.150e-04; norm: 1.327e-01; mom: 4.987e-01;
## best it: 246; best obj: 1.977e+00
## It: 363; obj: 1.978e+00; abs: 7.960e-04; rel: 4.025e-04; norm: 1.325e-01; mom: 8.055e-01;
## best it: 246; best obj: 1.977e+00
## It: 364; obj: 1.980e+00; abs: 1.421e-03; rel: 7.183e-04; norm: 1.327e-01; mom: 9.715e-01;
## best it: 246; best obj: 1.977e+00
## It: 365; obj: 1.978e+00; abs: 1.779e-03; rel: 8.984e-04; norm: 1.327e-01; mom: 8.744e-01;
## best it: 246; best obj: 1.977e+00
## It: 366; obj: 1.977e+00; abs: 1.065e-03; rel: 5.385e-04; norm: 1.327e-01; mom: 1.520e+00;
## best it: 246; best obj: 1.977e+00
## It: 367; obj: 1.978e+00; abs: 9.594e-04; rel: 4.853e-04; norm: 1.327e-01; mom: 6.572e-01;
## best it: 246; best obj: 1.977e+00
## It: 368; obj: 1.978e+00; abs: 3.289e-04; rel: 1.663e-04; norm: 1.326e-01; mom: 7.923e-01;
## best it: 246; best obj: 1.977e+00
## It: 369; obj: 1.980e+00; abs: 1.772e-03; rel: 8.958e-04; norm: 1.328e-01; mom: 9.739e-01;
## best it: 246; best obj: 1.977e+00
## It: 370; obj: 1.978e+00; abs: 2.063e-03; rel: 1.042e-03; norm: 1.327e-01; mom: 8.410e-01;
## best it: 246; best obj: 1.977e+00
## It: 371; obj: 1.977e+00; abs: 7.509e-04; rel: 3.796e-04; norm: 1.327e-01; mom: 1.520e+00;
## best it: 246; best obj: 1.977e+00
## It: 372; obj: 1.978e+00; abs: 1.042e-03; rel: 5.272e-04; norm: 1.327e-01; mom: 7.493e-01;
## best it: 246; best obj: 1.977e+00
## It: 373; obj: 1.978e+00; abs: 1.741e-04; rel: 8.802e-05; norm: 1.326e-01; mom: 7.967e-01;
## best it: 246; best obj: 1.977e+00
## It: 374; obj: 1.980e+00; abs: 1.729e-03; rel: 8.740e-04; norm: 1.328e-01; mom: 9.761e-01;
## best it: 246; best obj: 1.977e+00
## It: 375; obj: 1.979e+00; abs: 1.631e-03; rel: 8.239e-04; norm: 1.327e-01; mom: 9.011e-01;
## best it: 246; best obj: 1.977e+00

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## It: 376; obj: 1.979e+00; abs: 2.141e-04; rel: 1.082e-04; norm: 1.327e-01; mom: 1.537e+00;
## best it: 246; best obj: 1.977e+00
## It: 377; obj: 1.980e+00; abs: 9.325e-04; rel: 4.712e-04; norm: 1.328e-01; mom: 1.324e+00;
## best it: 246; best obj: 1.977e+00
## It: 378; obj: 1.980e+00; abs: 3.634e-05; rel: 1.836e-05; norm: 1.326e-01; mom: 7.499e-01;
## best it: 246; best obj: 1.977e+00
## It: 379; obj: 1.981e+00; abs: 1.726e-03; rel: 8.721e-04; norm: 1.327e-01; mom: 1.429e+00;
## best it: 246; best obj: 1.977e+00
## It: 380; obj: 1.981e+00; abs: 6.706e-04; rel: 3.384e-04; norm: 1.327e-01; mom: 8.055e-01;
## best it: 246; best obj: 1.977e+00
## It: 381; obj: 1.980e+00; abs: 1.087e-03; rel: 5.488e-04; norm: 1.328e-01; mom: 1.770e+00;
## best it: 246; best obj: 1.977e+00
## It: 382; obj: 1.979e+00; abs: 9.795e-04; rel: 4.948e-04; norm: 1.328e-01; mom: 4.179e-01;
## best it: 246; best obj: 1.977e+00

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## It: 383; obj: 1.980e+00; abs: 1.244e-03; rel: 6.286e-04; norm: 1.325e-01; mom: 1.614e+00;
## best it: 246; best obj: 1.977e+00
## It: 384; obj: 1.983e+00; abs: 2.652e-03; rel: 1.339e-03; norm: 1.327e-01; mom: 1.011e+00;
## best it: 246; best obj: 1.977e+00
## It: 385; obj: 1.980e+00; abs: 2.407e-03; rel: 1.214e-03; norm: 1.328e-01; mom: 1.630e+00;
## best it: 246; best obj: 1.977e+00
## It: 386; obj: 1.978e+00; abs: 1.908e-03; rel: 9.637e-04; norm: 1.328e-01; mom: 1.542e+00;
## best it: 246; best obj: 1.977e+00
## It: 387; obj: 1.979e+00; abs: 6.653e-04; rel: 3.363e-04; norm: 1.327e-01; mom: 1.481e+00;
## best it: 246; best obj: 1.977e+00
## It: 388; obj: 1.981e+00; abs: 2.467e-03; rel: 1.247e-03; norm: 1.325e-01; mom: 7.519e-01;
## best it: 246; best obj: 1.977e+00
## It: 389; obj: 1.982e+00; abs: 1.028e-03; rel: 5.188e-04; norm: 1.328e-01; mom: 1.533e+00;
## best it: 246; best obj: 1.977e+00
## It: 390; obj: 1.979e+00; abs: 3.520e-03; rel: 1.775e-03; norm: 1.328e-01; mom: 7.494e-01;
## best it: 246; best obj: 1.977e+00
## It: 391; obj: 1.978e+00; abs: 4.335e-04; rel: 2.191e-04; norm: 1.327e-01; mom: 1.703e+00;
## best it: 246; best obj: 1.977e+00
## It: 392; obj: 1.980e+00; abs: 1.757e-03; rel: 8.883e-04; norm: 1.327e-01; mom: 3.768e-01;
## best it: 246; best obj: 1.977e+00
## It: 393; obj: 1.981e+00; abs: 7.615e-04; rel: 3.846e-04; norm: 1.326e-01; mom: 1.666e+00;
## best it: 246; best obj: 1.977e+00
## It: 394; obj: 1.981e+00; abs: 3.127e-05; rel: 1.578e-05; norm: 1.328e-01; mom: 9.842e-01;
## best it: 246; best obj: 1.977e+00
## It: 395; obj: 1.979e+00; abs: 1.882e-03; rel: 9.499e-04; norm: 1.327e-01; mom: 1.593e+00;
## best it: 246; best obj: 1.977e+00
## It: 396; obj: 1.980e+00; abs: 7.262e-04; rel: 3.669e-04; norm: 1.327e-01; mom: 1.533e+00;
## best it: 246; best obj: 1.977e+00
## It: 397; obj: 1.980e+00; abs: 1.690e-04; rel: 8.538e-05; norm: 1.328e-01; mom: 1.547e+00;
## best it: 246; best obj: 1.977e+00
## It: 398; obj: 1.980e+00; abs: 3.255e-04; rel: 1.644e-04; norm: 1.326e-01; mom: 7.529e-01;
## best it: 246; best obj: 1.977e+00
## It: 399; obj: 1.981e+00; abs: 1.584e-03; rel: 8.000e-04; norm: 1.327e-01; mom: 1.460e+00;
## best it: 246; best obj: 1.977e+00
## It: 400; obj: 1.980e+00; abs: 7.974e-04; rel: 4.024e-04; norm: 1.327e-01; mom: 7.818e-01;
## best it: 246; best obj: 1.977e+00

## It: 401; obj: 1.980e+00; abs: 9.318e-04; rel: 4.705e-04; norm: 1.328e-01; mom: 1.764e+00;
## best it: 246; best obj: 1.977e+00
## It: 402; obj: 1.979e+00; abs: 8.824e-04; rel: 4.458e-04; norm: 1.328e-01; mom: 4.024e-01;
## best it: 246; best obj: 1.977e+00
## It: 403; obj: 1.980e+00; abs: 1.285e-03; rel: 6.493e-04; norm: 1.325e-01; mom: 1.604e+00;
## best it: 246; best obj: 1.977e+00
## It: 404; obj: 1.983e+00; abs: 2.692e-03; rel: 1.360e-03; norm: 1.327e-01; mom: 1.015e+00;
## best it: 246; best obj: 1.977e+00
## It: 405; obj: 1.980e+00; abs: 2.455e-03; rel: 1.238e-03; norm: 1.328e-01; mom: 1.641e+00;
## best it: 246; best obj: 1.977e+00
## It: 406; obj: 1.978e+00; abs: 1.932e-03; rel: 9.757e-04; norm: 1.328e-01; mom: 1.545e+00;
## best it: 246; best obj: 1.977e+00
## It: 407; obj: 1.979e+00; abs: 6.484e-04; rel: 3.278e-04; norm: 1.327e-01; mom: 1.486e+00;
## best it: 246; best obj: 1.977e+00
## It: 408; obj: 1.981e+00; abs: 2.447e-03; rel: 1.237e-03; norm: 1.325e-01; mom: 7.509e-01;
## best it: 246; best obj: 1.977e+00
## It: 409; obj: 1.982e+00; abs: 1.035e-03; rel: 5.225e-04; norm: 1.328e-01; mom: 1.529e+00;

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## best it: 246; best obj: 1.977e+00
## It: 410; obj: 1.979e+00; abs: 3.508e-03; rel: 1.770e-03; norm: 1.328e-01; mom: 7.439e-01;
## best it: 246; best obj: 1.977e+00
## It: 411; obj: 1.978e+00; abs: 4.198e-04; rel: 2.122e-04; norm: 1.327e-01; mom: 1.703e+00;
## best it: 246; best obj: 1.977e+00
## It: 412; obj: 1.980e+00; abs: 1.768e-03; rel: 8.938e-04; norm: 1.327e-01; mom: 3.738e-01;
## best it: 246; best obj: 1.977e+00
## It: 413; obj: 1.981e+00; abs: 7.580e-04; rel: 3.828e-04; norm: 1.326e-01; mom: 1.668e+00;
## best it: 246; best obj: 1.977e+00
## It: 414; obj: 1.981e+00; abs: 2.842e-05; rel: 1.434e-05; norm: 1.328e-01; mom: 9.846e-01;
## best it: 246; best obj: 1.977e+00
## It: 415; obj: 1.979e+00; abs: 1.888e-03; rel: 9.529e-04; norm: 1.327e-01; mom: 1.595e+00;
## best it: 246; best obj: 1.977e+00
## It: 416; obj: 1.980e+00; abs: 7.184e-04; rel: 3.630e-04; norm: 1.327e-01; mom: 1.533e+00;
## best it: 246; best obj: 1.977e+00
## It: 417; obj: 1.980e+00; abs: 1.682e-04; rel: 8.498e-05; norm: 1.328e-01; mom: 1.547e+00;
## best it: 246; best obj: 1.977e+00
## It: 418; obj: 1.980e+00; abs: 3.248e-04; rel: 1.640e-04; norm: 1.326e-01; mom: 7.531e-01;
## best it: 246; best obj: 1.977e+00
## It: 419; obj: 1.981e+00; abs: 1.587e-03; rel: 8.018e-04; norm: 1.327e-01; mom: 1.458e+00;
## best it: 246; best obj: 1.977e+00
## It: 420; obj: 1.980e+00; abs: 7.910e-04; rel: 3.992e-04; norm: 1.327e-01; mom: 7.805e-01;
## best it: 246; best obj: 1.977e+00
## It: 421; obj: 1.980e+00; abs: 9.283e-04; rel: 4.687e-04; norm: 1.328e-01; mom: 1.763e+00;
## best it: 246; best obj: 1.977e+00
## It: 422; obj: 1.979e+00; abs: 8.818e-04; rel: 4.455e-04; norm: 1.328e-01; mom: 4.016e-01;
## best it: 246; best obj: 1.977e+00
## It: 423; obj: 1.980e+00; abs: 1.280e-03; rel: 6.471e-04; norm: 1.325e-01; mom: 1.606e+00;
## best it: 246; best obj: 1.977e+00
## It: 424; obj: 1.983e+00; abs: 2.686e-03; rel: 1.356e-03; norm: 1.327e-01; mom: 1.015e+00;
## best it: 246; best obj: 1.977e+00
## It: 425; obj: 1.980e+00; abs: 2.458e-03; rel: 1.240e-03; norm: 1.328e-01; mom: 1.641e+00;
## best it: 246; best obj: 1.977e+00

## It: 426; obj: 1.978e+00; abs: 1.933e-03; rel: 9.760e-04; norm: 1.328e-01; mom: 1.545e+00;
## best it: 246; best obj: 1.977e+00
## It: 427; obj: 1.979e+00; abs: 6.527e-04; rel: 3.299e-04; norm: 1.327e-01; mom: 1.484e+00;
## best it: 246; best obj: 1.977e+00
## It: 428; obj: 1.981e+00; abs: 2.454e-03; rel: 1.240e-03; norm: 1.325e-01; mom: 7.511e-01;
## best it: 246; best obj: 1.977e+00
## It: 429; obj: 1.982e+00; abs: 1.037e-03; rel: 5.236e-04; norm: 1.328e-01; mom: 1.529e+00;
## best it: 246; best obj: 1.977e+00
## It: 430; obj: 1.979e+00; abs: 3.508e-03; rel: 1.770e-03; norm: 1.328e-01; mom: 7.434e-01;
## best it: 246; best obj: 1.977e+00
## It: 431; obj: 1.978e+00; abs: 4.239e-04; rel: 2.142e-04; norm: 1.327e-01; mom: 1.704e+00;
## best it: 246; best obj: 1.977e+00
## It: 432; obj: 1.980e+00; abs: 1.761e-03; rel: 8.902e-04; norm: 1.327e-01; mom: 3.736e-01;
## best it: 246; best obj: 1.977e+00
## It: 433; obj: 1.981e+00; abs: 7.563e-04; rel: 3.819e-04; norm: 1.326e-01; mom: 1.668e+00;
## best it: 246; best obj: 1.977e+00
## It: 434; obj: 1.981e+00; abs: 2.762e-05; rel: 1.394e-05; norm: 1.328e-01; mom: 9.847e-01;
## best it: 246; best obj: 1.977e+00
## It: 435; obj: 1.979e+00; abs: 1.884e-03; rel: 9.509e-04; norm: 1.327e-01; mom: 1.593e+00;
## best it: 246; best obj: 1.977e+00

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## It: 436; obj: 1.980e+00; abs: 7.250e-04; rel: 3.663e-04; norm: 1.327e-01; mom: 1.533e+00;
## best it: 246; best obj: 1.977e+00
## It: 437; obj: 1.980e+00; abs: 1.709e-04; rel: 8.631e-05; norm: 1.328e-01; mom: 1.547e+00;
## best it: 246; best obj: 1.977e+00
## It: 438; obj: 1.980e+00; abs: 3.242e-04; rel: 1.638e-04; norm: 1.326e-01; mom: 7.531e-01;
## best it: 246; best obj: 1.977e+00
## It: 439; obj: 1.981e+00; abs: 1.584e-03; rel: 7.999e-04; norm: 1.327e-01; mom: 1.460e+00;
## best it: 246; best obj: 1.977e+00
## It: 440; obj: 1.980e+00; abs: 7.972e-04; rel: 4.024e-04; norm: 1.327e-01; mom: 7.807e-01;
## best it: 246; best obj: 1.977e+00
## It: 441; obj: 1.980e+00; abs: 9.307e-04; rel: 4.699e-04; norm: 1.328e-01; mom: 1.764e+00;
## best it: 246; best obj: 1.977e+00
## It: 442; obj: 1.979e+00; abs: 8.823e-04; rel: 4.457e-04; norm: 1.328e-01; mom: 4.017e-01;
## best it: 246; best obj: 1.977e+00
## It: 443; obj: 1.980e+00; abs: 1.284e-03; rel: 6.490e-04; norm: 1.325e-01; mom: 1.605e+00;
## best it: 246; best obj: 1.977e+00
## It: 444; obj: 1.983e+00; abs: 2.691e-03; rel: 1.359e-03; norm: 1.327e-01; mom: 1.015e+00;
## best it: 246; best obj: 1.977e+00
## It: 445; obj: 1.980e+00; abs: 2.456e-03; rel: 1.239e-03; norm: 1.328e-01; mom: 1.641e+00;
## best it: 246; best obj: 1.977e+00
## It: 446; obj: 1.978e+00; abs: 1.932e-03; rel: 9.755e-04; norm: 1.328e-01; mom: 1.545e+00;
## best it: 246; best obj: 1.977e+00
## It: 447; obj: 1.979e+00; abs: 6.488e-04; rel: 3.280e-04; norm: 1.327e-01; mom: 1.486e+00;
## best it: 246; best obj: 1.977e+00
## It: 448; obj: 1.981e+00; abs: 2.448e-03; rel: 1.237e-03; norm: 1.325e-01; mom: 7.509e-01;
## best it: 246; best obj: 1.977e+00
## It: 449; obj: 1.982e+00; abs: 1.035e-03; rel: 5.226e-04; norm: 1.328e-01; mom: 1.529e+00;
## best it: 246; best obj: 1.977e+00
## It: 450; obj: 1.979e+00; abs: 3.508e-03; rel: 1.770e-03; norm: 1.328e-01; mom: 7.436e-01;
## best it: 246; best obj: 1.977e+00

## It: 451; obj: 1.978e+00; abs: 4.201e-04; rel: 2.123e-04; norm: 1.327e-01; mom: 1.703e+00;
## best it: 246; best obj: 1.977e+00
## It: 452; obj: 1.980e+00; abs: 1.768e-03; rel: 8.934e-04; norm: 1.327e-01; mom: 3.737e-01;
## best it: 246; best obj: 1.977e+00
## It: 453; obj: 1.981e+00; abs: 7.579e-04; rel: 3.827e-04; norm: 1.326e-01; mom: 1.668e+00;
## best it: 246; best obj: 1.977e+00
## It: 454; obj: 1.981e+00; abs: 2.828e-05; rel: 1.428e-05; norm: 1.328e-01; mom: 9.846e-01;
## best it: 246; best obj: 1.977e+00
## It: 455; obj: 1.979e+00; abs: 1.887e-03; rel: 9.527e-04; norm: 1.327e-01; mom: 1.595e+00;
## best it: 246; best obj: 1.977e+00
## It: 456; obj: 1.980e+00; abs: 7.191e-04; rel: 3.634e-04; norm: 1.327e-01; mom: 1.533e+00;
## best it: 246; best obj: 1.977e+00
## It: 457; obj: 1.980e+00; abs: 1.686e-04; rel: 8.514e-05; norm: 1.328e-01; mom: 1.547e+00;
## best it: 246; best obj: 1.977e+00
## It: 458; obj: 1.980e+00; abs: 3.247e-04; rel: 1.640e-04; norm: 1.326e-01; mom: 7.531e-01;
## best it: 246; best obj: 1.977e+00
## It: 459; obj: 1.981e+00; abs: 1.587e-03; rel: 8.015e-04; norm: 1.327e-01; mom: 1.459e+00;
## best it: 246; best obj: 1.977e+00
## It: 460; obj: 1.980e+00; abs: 7.917e-04; rel: 3.996e-04; norm: 1.327e-01; mom: 7.805e-01;
## best it: 246; best obj: 1.977e+00
## It: 461; obj: 1.980e+00; abs: 9.284e-04; rel: 4.688e-04; norm: 1.328e-01; mom: 1.763e+00;
## best it: 246; best obj: 1.977e+00
## It: 462; obj: 1.979e+00; abs: 8.819e-04; rel: 4.455e-04; norm: 1.328e-01; mom: 4.015e-01;

```

```

## best it: 246; best obj: 1.977e+00
## It: 463; obj: 1.980e+00; abs: 1.281e-03; rel: 6.472e-04; norm: 1.325e-01; mom: 1.606e+00;
## best it: 246; best obj: 1.977e+00
## It: 464; obj: 1.983e+00; abs: 2.686e-03; rel: 1.357e-03; norm: 1.327e-01; mom: 1.015e+00;
## best it: 246; best obj: 1.977e+00
## It: 465; obj: 1.980e+00; abs: 2.458e-03; rel: 1.240e-03; norm: 1.328e-01; mom: 1.641e+00;
## best it: 246; best obj: 1.977e+00
## It: 466; obj: 1.978e+00; abs: 1.932e-03; rel: 9.759e-04; norm: 1.328e-01; mom: 1.545e+00;
## best it: 246; best obj: 1.977e+00
## It: 467; obj: 1.979e+00; abs: 6.523e-04; rel: 3.298e-04; norm: 1.327e-01; mom: 1.484e+00;
## best it: 246; best obj: 1.977e+00
## It: 468; obj: 1.981e+00; abs: 2.453e-03; rel: 1.240e-03; norm: 1.325e-01; mom: 7.511e-01;
## best it: 246; best obj: 1.977e+00
## It: 469; obj: 1.982e+00; abs: 1.037e-03; rel: 5.235e-04; norm: 1.328e-01; mom: 1.529e+00;
## best it: 246; best obj: 1.977e+00
## It: 470; obj: 1.979e+00; abs: 3.508e-03; rel: 1.770e-03; norm: 1.328e-01; mom: 7.434e-01;
## best it: 246; best obj: 1.977e+00
## It: 471; obj: 1.978e+00; abs: 4.235e-04; rel: 2.140e-04; norm: 1.327e-01; mom: 1.704e+00;
## best it: 246; best obj: 1.977e+00
## It: 472; obj: 1.980e+00; abs: 1.762e-03; rel: 8.905e-04; norm: 1.327e-01; mom: 3.736e-01;
## best it: 246; best obj: 1.977e+00
## It: 473; obj: 1.981e+00; abs: 7.564e-04; rel: 3.820e-04; norm: 1.326e-01; mom: 1.668e+00;
## best it: 246; best obj: 1.977e+00
## It: 474; obj: 1.981e+00; abs: 2.767e-05; rel: 1.397e-05; norm: 1.328e-01; mom: 9.847e-01;
## best it: 246; best obj: 1.977e+00
## It: 475; obj: 1.979e+00; abs: 1.884e-03; rel: 9.510e-04; norm: 1.327e-01; mom: 1.594e+00;
## best it: 246; best obj: 1.977e+00

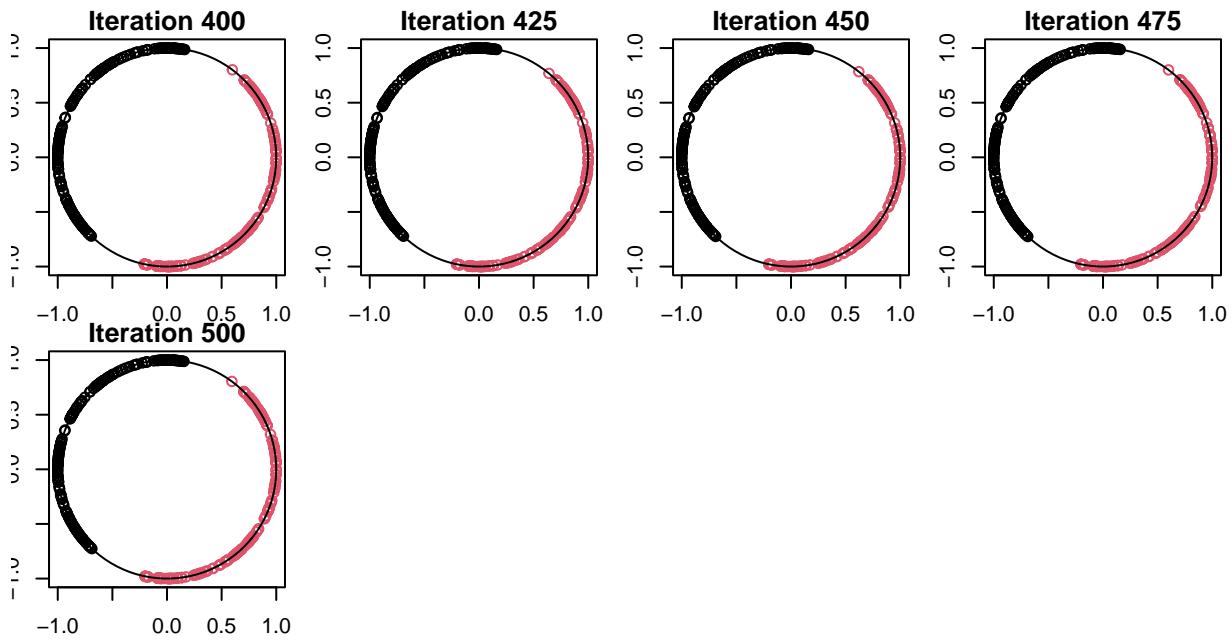
## It: 476; obj: 1.980e+00; abs: 7.245e-04; rel: 3.661e-04; norm: 1.327e-01; mom: 1.533e+00;
## best it: 246; best obj: 1.977e+00
## It: 477; obj: 1.980e+00; abs: 1.707e-04; rel: 8.620e-05; norm: 1.328e-01; mom: 1.547e+00;
## best it: 246; best obj: 1.977e+00
## It: 478; obj: 1.980e+00; abs: 3.243e-04; rel: 1.638e-04; norm: 1.326e-01; mom: 7.531e-01;
## best it: 246; best obj: 1.977e+00
## It: 479; obj: 1.981e+00; abs: 1.584e-03; rel: 8.000e-04; norm: 1.327e-01; mom: 1.460e+00;
## best it: 246; best obj: 1.977e+00
## It: 480; obj: 1.980e+00; abs: 7.967e-04; rel: 4.021e-04; norm: 1.327e-01; mom: 7.807e-01;
## best it: 246; best obj: 1.977e+00
## It: 481; obj: 1.980e+00; abs: 9.304e-04; rel: 4.698e-04; norm: 1.328e-01; mom: 1.764e+00;
## best it: 246; best obj: 1.977e+00
## It: 482; obj: 1.979e+00; abs: 8.823e-04; rel: 4.457e-04; norm: 1.328e-01; mom: 4.017e-01;
## best it: 246; best obj: 1.977e+00
## It: 483; obj: 1.980e+00; abs: 1.284e-03; rel: 6.488e-04; norm: 1.325e-01; mom: 1.605e+00;
## best it: 246; best obj: 1.977e+00
## It: 484; obj: 1.983e+00; abs: 2.690e-03; rel: 1.359e-03; norm: 1.327e-01; mom: 1.015e+00;
## best it: 246; best obj: 1.977e+00
## It: 485; obj: 1.980e+00; abs: 2.456e-03; rel: 1.239e-03; norm: 1.328e-01; mom: 1.641e+00;
## best it: 246; best obj: 1.977e+00
## It: 486; obj: 1.978e+00; abs: 1.932e-03; rel: 9.755e-04; norm: 1.328e-01; mom: 1.545e+00;
## best it: 246; best obj: 1.977e+00
## It: 487; obj: 1.979e+00; abs: 6.492e-04; rel: 3.282e-04; norm: 1.327e-01; mom: 1.486e+00;
## best it: 246; best obj: 1.977e+00
## It: 488; obj: 1.981e+00; abs: 2.448e-03; rel: 1.237e-03; norm: 1.325e-01; mom: 7.509e-01;
## best it: 246; best obj: 1.977e+00

```

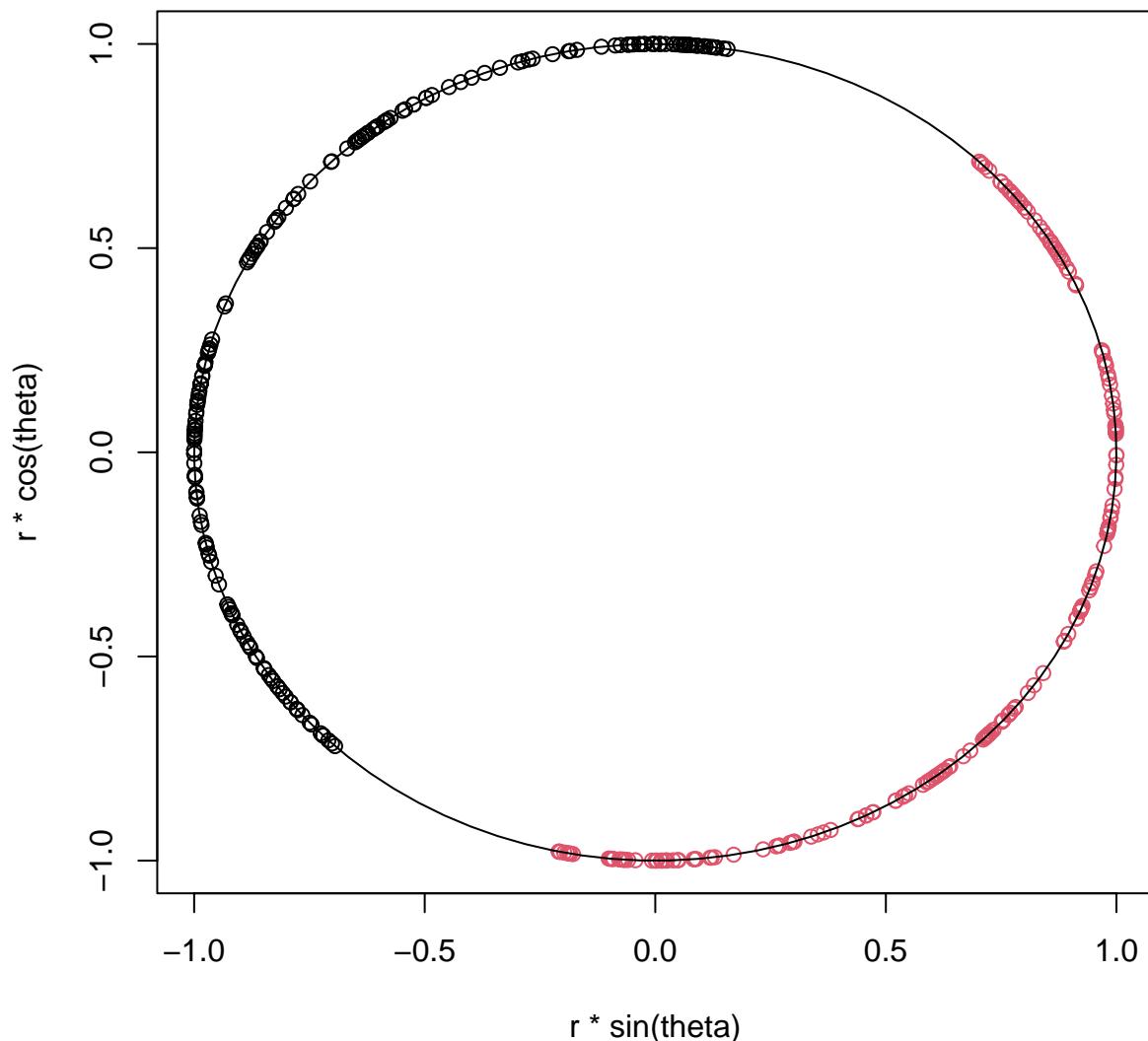
```

## It: 489; obj: 1.982e+00; abs: 1.036e-03; rel: 5.226e-04; norm: 1.328e-01; mom: 1.529e+00;
## best it: 246; best obj: 1.977e+00
## It: 490; obj: 1.979e+00; abs: 3.508e-03; rel: 1.770e-03; norm: 1.328e-01; mom: 7.436e-01;
## best it: 246; best obj: 1.977e+00
## It: 491; obj: 1.978e+00; abs: 4.204e-04; rel: 2.124e-04; norm: 1.327e-01; mom: 1.703e+00;
## best it: 246; best obj: 1.977e+00
## It: 492; obj: 1.980e+00; abs: 1.767e-03; rel: 8.931e-04; norm: 1.327e-01; mom: 3.737e-01;
## best it: 246; best obj: 1.977e+00
## It: 493; obj: 1.981e+00; abs: 7.578e-04; rel: 3.827e-04; norm: 1.326e-01; mom: 1.668e+00;
## best it: 246; best obj: 1.977e+00
## It: 494; obj: 1.981e+00; abs: 2.822e-05; rel: 1.425e-05; norm: 1.328e-01; mom: 9.846e-01;
## best it: 246; best obj: 1.977e+00
## It: 495; obj: 1.979e+00; abs: 1.887e-03; rel: 9.526e-04; norm: 1.327e-01; mom: 1.595e+00;
## best it: 246; best obj: 1.977e+00
## It: 496; obj: 1.980e+00; abs: 7.197e-04; rel: 3.636e-04; norm: 1.327e-01; mom: 1.533e+00;
## best it: 246; best obj: 1.977e+00
## It: 497; obj: 1.980e+00; abs: 1.688e-04; rel: 8.524e-05; norm: 1.328e-01; mom: 1.547e+00;
## best it: 246; best obj: 1.977e+00
## It: 498; obj: 1.980e+00; abs: 3.247e-04; rel: 1.640e-04; norm: 1.326e-01; mom: 7.531e-01;
## best it: 246; best obj: 1.977e+00
## It: 499; obj: 1.981e+00; abs: 1.586e-03; rel: 8.014e-04; norm: 1.327e-01; mom: 1.459e+00;
## best it: 246; best obj: 1.977e+00
## It: 500; obj: 1.980e+00; abs: 7.921e-04; rel: 3.998e-04; norm: 1.327e-01; mom: 7.805e-01;
## best it: 246; best obj: 1.977e+00

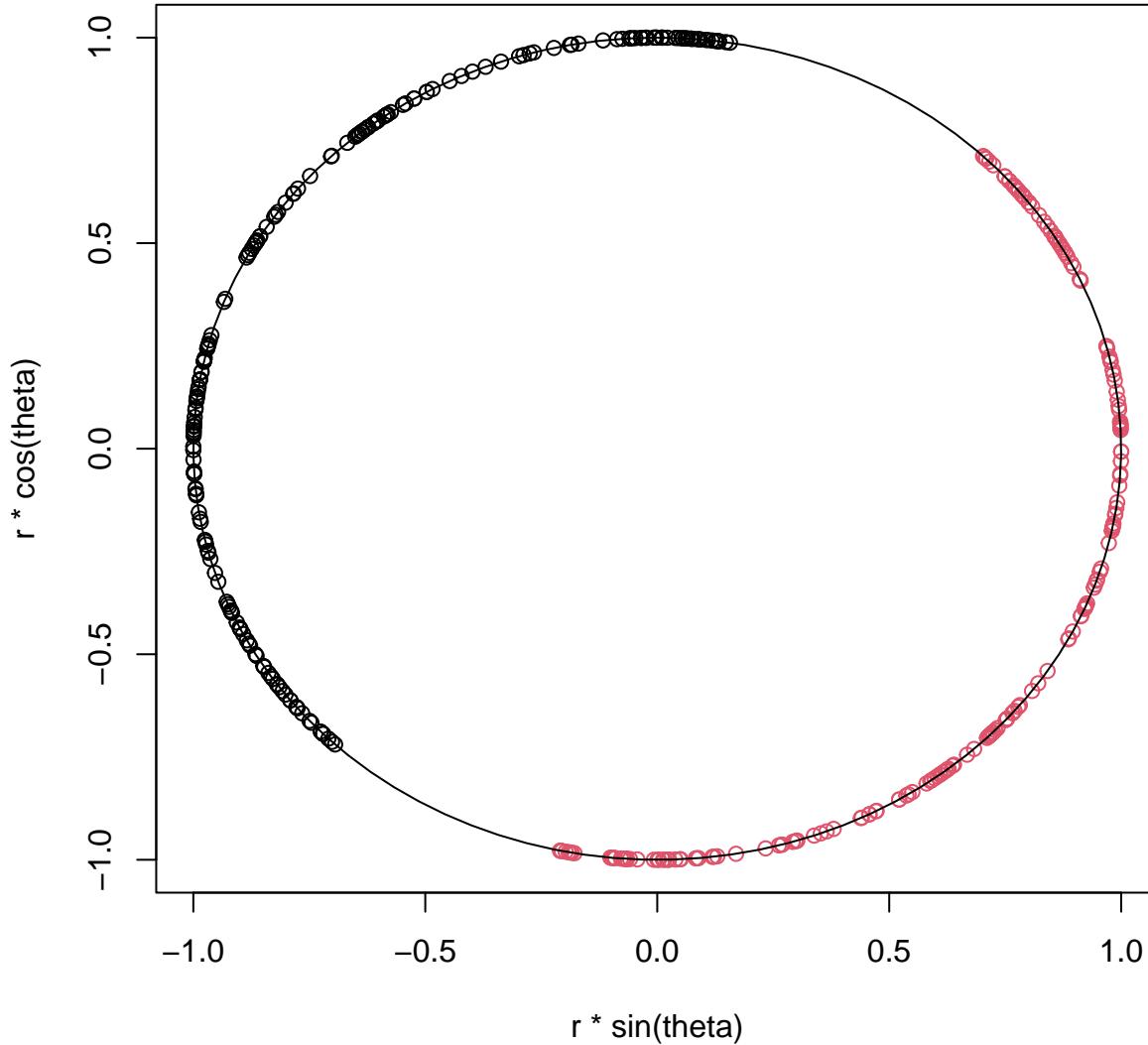
```



## Iteration 246



```
Y <- res_pscsne$best_Y  
Y_rad <- DirStats:::to_rad(Y)  
r <- 1  
theta <- Y_rad  
  
plot(r*sin(theta),  
     r*cos(theta),  
     col=colors,  
     xlim=c(-max(r),max(r)),  
     ylim=c(-max(r),max(r)))  
  
polygon(max(r)*sin(seq(0,2*pi,length.out=100)),max(r)*cos(seq(0,2*pi,length.out=100)))
```



Now we are going to reduce to dimension  $\mathbb{S}^2$  then  $d = 2$  (sphere):

```
res_pscsne <- psc_sne(X=x_array, d=2, rho_psc_list = rho_first_20,
                        num_iteration=500, colors=colors, show_prog = TRUE,
                        eta=100, check=F)

## It: 1; obj: 1.700e+01; abs: 0.000e+00; rel: 0.000e+00; norm: 2.231e-01; mom: 0.000e+00;
## best it: 1; best obj: 1.700e+01

## It: 2; obj: 1.423e+01; abs: 2.767e+00; rel: 1.628e-01; norm: 5.349e-01; mom: 7.390e+00;
## best it: 2; best obj: 1.423e+01
## It: 3; obj: 1.337e+01; abs: 8.674e-01; rel: 6.094e-02; norm: 8.796e-01; mom: 3.675e+00;
## best it: 3; best obj: 1.337e+01
## It: 4; obj: 1.297e+01; abs: 3.945e-01; rel: 2.951e-02; norm: 1.006e+00; mom: 1.841e+00;
## best it: 4; best obj: 1.297e+01
## It: 5; obj: 1.272e+01; abs: 2.486e-01; rel: 1.916e-02; norm: 1.076e+00; mom: 1.027e+00;
## best it: 5; best obj: 1.272e+01
## It: 6; obj: 1.251e+01; abs: 2.125e-01; rel: 1.670e-02; norm: 1.139e+00; mom: 8.155e-01;
## best it: 6; best obj: 1.251e+01
## It: 7; obj: 1.233e+01; abs: 1.810e-01; rel: 1.447e-02; norm: 1.201e+00; mom: 7.933e-01;
## best it: 7; best obj: 1.233e+01
```

```

## It: 8; obj: 1.217e+01; abs: 1.603e-01; rel: 1.300e-02; norm: 1.259e+00; mom: 6.717e-01;
## best it: 8; best obj: 1.217e+01
## It: 9; obj: 1.202e+01; abs: 1.454e-01; rel: 1.195e-02; norm: 1.318e+00; mom: 6.251e-01;
## best it: 9; best obj: 1.202e+01
## It: 10; obj: 1.190e+01; abs: 1.222e-01; rel: 1.017e-02; norm: 1.378e+00; mom: 5.860e-01;
## best it: 10; best obj: 1.190e+01
## It: 11; obj: 1.182e+01; abs: 8.325e-02; rel: 6.994e-03; norm: 1.441e+00; mom: 5.639e-01;
## best it: 11; best obj: 1.182e+01
## It: 12; obj: 1.178e+01; abs: 4.115e-02; rel: 3.482e-03; norm: 1.507e+00; mom: 5.086e-01;
## best it: 12; best obj: 1.178e+01
## It: 13; obj: 1.177e+01; abs: 5.195e-03; rel: 4.411e-04; norm: 1.575e+00; mom: 4.574e-01;
## best it: 13; best obj: 1.177e+01
## It: 14; obj: 1.179e+01; abs: 2.097e-02; rel: 1.781e-03; norm: 1.641e+00; mom: 4.124e-01;
## best it: 13; best obj: 1.177e+01
## It: 15; obj: 1.183e+01; abs: 3.990e-02; rel: 3.383e-03; norm: 1.706e+00; mom: 3.758e-01;
## best it: 13; best obj: 1.177e+01
## It: 16; obj: 1.189e+01; abs: 5.500e-02; rel: 4.648e-03; norm: 1.769e+00; mom: 3.436e-01;
## best it: 13; best obj: 1.177e+01
## It: 17; obj: 1.195e+01; abs: 6.587e-02; rel: 5.541e-03; norm: 1.828e+00; mom: 3.063e-01;
## best it: 13; best obj: 1.177e+01
## It: 18; obj: 1.203e+01; abs: 7.184e-02; rel: 6.010e-03; norm: 1.882e+00; mom: 2.731e-01;
## best it: 13; best obj: 1.177e+01
## It: 19; obj: 1.210e+01; abs: 7.351e-02; rel: 6.113e-03; norm: 1.930e+00; mom: 2.644e-01;
## best it: 13; best obj: 1.177e+01
## It: 20; obj: 1.217e+01; abs: 7.180e-02; rel: 5.935e-03; norm: 1.974e+00; mom: 2.511e-01;
## best it: 13; best obj: 1.177e+01
## It: 21; obj: 1.224e+01; abs: 6.792e-02; rel: 5.581e-03; norm: 2.012e+00; mom: 2.336e-01;
## best it: 13; best obj: 1.177e+01
## It: 22; obj: 1.230e+01; abs: 6.280e-02; rel: 5.131e-03; norm: 2.046e+00; mom: 2.155e-01;
## best it: 13; best obj: 1.177e+01
## It: 23; obj: 1.236e+01; abs: 5.690e-02; rel: 4.625e-03; norm: 2.076e+00; mom: 2.010e-01;
## best it: 13; best obj: 1.177e+01
## It: 24; obj: 1.241e+01; abs: 5.037e-02; rel: 4.076e-03; norm: 2.103e+00; mom: 1.925e-01;
## best it: 13; best obj: 1.177e+01
## It: 25; obj: 1.245e+01; abs: 4.352e-02; rel: 3.507e-03; norm: 2.128e+00; mom: 1.898e-01;
## best it: 13; best obj: 1.177e+01

## It: 26; obj: 1.249e+01; abs: 3.697e-02; rel: 2.969e-03; norm: 2.152e+00; mom: 1.906e-01;
## best it: 13; best obj: 1.177e+01
## It: 27; obj: 1.252e+01; abs: 3.112e-02; rel: 2.492e-03; norm: 2.173e+00; mom: 1.932e-01;
## best it: 13; best obj: 1.177e+01
## It: 28; obj: 1.255e+01; abs: 2.538e-02; rel: 2.027e-03; norm: 2.193e+00; mom: 1.972e-01;
## best it: 13; best obj: 1.177e+01
## It: 29; obj: 1.256e+01; abs: 1.877e-02; rel: 1.496e-03; norm: 2.212e+00; mom: 2.021e-01;
## best it: 13; best obj: 1.177e+01
## It: 30; obj: 1.258e+01; abs: 1.117e-02; rel: 8.890e-04; norm: 2.229e+00; mom: 2.066e-01;
## best it: 13; best obj: 1.177e+01
## It: 31; obj: 1.258e+01; abs: 3.319e-03; rel: 2.639e-04; norm: 2.244e+00; mom: 2.066e-01;
## best it: 13; best obj: 1.177e+01
## It: 32; obj: 1.258e+01; abs: 4.239e-03; rel: 3.370e-04; norm: 2.258e+00; mom: 1.981e-01;
## best it: 13; best obj: 1.177e+01
## It: 33; obj: 1.256e+01; abs: 1.133e-02; rel: 9.012e-04; norm: 2.269e+00; mom: 1.822e-01;
## best it: 13; best obj: 1.177e+01
## It: 34; obj: 1.255e+01; abs: 1.774e-02; rel: 1.412e-03; norm: 2.277e+00; mom: 1.635e-01;

```

```

## best it: 13; best obj: 1.177e+01
## It: 35; obj: 1.252e+01; abs: 2.309e-02; rel: 1.840e-03; norm: 2.283e+00; mom: 1.461e-01;
## best it: 13; best obj: 1.177e+01
## It: 36; obj: 1.250e+01; abs: 2.700e-02; rel: 2.156e-03; norm: 2.287e+00; mom: 1.324e-01;
## best it: 13; best obj: 1.177e+01
## It: 37; obj: 1.247e+01; abs: 2.938e-02; rel: 2.351e-03; norm: 2.289e+00; mom: 1.219e-01;
## best it: 13; best obj: 1.177e+01
## It: 38; obj: 1.244e+01; abs: 3.033e-02; rel: 2.433e-03; norm: 2.290e+00; mom: 1.130e-01;
## best it: 13; best obj: 1.177e+01
## It: 39; obj: 1.241e+01; abs: 3.016e-02; rel: 2.426e-03; norm: 2.289e+00; mom: 1.045e-01;
## best it: 13; best obj: 1.177e+01
## It: 40; obj: 1.238e+01; abs: 2.920e-02; rel: 2.353e-03; norm: 2.288e+00; mom: 9.615e-02;
## best it: 13; best obj: 1.177e+01
## It: 41; obj: 1.235e+01; abs: 2.773e-02; rel: 2.240e-03; norm: 2.287e+00; mom: 8.783e-02;
## best it: 13; best obj: 1.177e+01
## It: 42; obj: 1.232e+01; abs: 2.599e-02; rel: 2.105e-03; norm: 2.285e+00; mom: 7.971e-02;
## best it: 13; best obj: 1.177e+01
## It: 43; obj: 1.230e+01; abs: 2.415e-02; rel: 1.960e-03; norm: 2.283e+00; mom: 7.198e-02;
## best it: 13; best obj: 1.177e+01
## It: 44; obj: 1.228e+01; abs: 2.232e-02; rel: 1.815e-03; norm: 2.280e+00; mom: 6.478e-02;
## best it: 13; best obj: 1.177e+01
## It: 45; obj: 1.226e+01; abs: 2.056e-02; rel: 1.675e-03; norm: 2.278e+00; mom: 5.819e-02;
## best it: 13; best obj: 1.177e+01
## It: 46; obj: 1.224e+01; abs: 1.891e-02; rel: 1.543e-03; norm: 2.275e+00; mom: 5.224e-02;
## best it: 13; best obj: 1.177e+01
## It: 47; obj: 1.222e+01; abs: 1.737e-02; rel: 1.419e-03; norm: 2.272e+00; mom: 4.691e-02;
## best it: 13; best obj: 1.177e+01
## It: 48; obj: 1.220e+01; abs: 1.596e-02; rel: 1.306e-03; norm: 2.270e+00; mom: 4.216e-02;
## best it: 13; best obj: 1.177e+01
## It: 49; obj: 1.219e+01; abs: 1.466e-02; rel: 1.202e-03; norm: 2.268e+00; mom: 3.795e-02;
## best it: 13; best obj: 1.177e+01
## It: 50; obj: 1.218e+01; abs: 1.348e-02; rel: 1.106e-03; norm: 2.265e+00; mom: 3.422e-02;
## best it: 13; best obj: 1.177e+01

## It: 51; obj: 1.216e+01; abs: 1.240e-02; rel: 1.019e-03; norm: 2.263e+00; mom: 3.091e-02;
## best it: 13; best obj: 1.177e+01
## It: 52; obj: 1.215e+01; abs: 1.142e-02; rel: 9.390e-04; norm: 2.261e+00; mom: 2.797e-02;
## best it: 13; best obj: 1.177e+01
## It: 53; obj: 1.214e+01; abs: 1.052e-02; rel: 8.660e-04; norm: 2.259e+00; mom: 2.536e-02;
## best it: 13; best obj: 1.177e+01
## It: 54; obj: 1.213e+01; abs: 9.704e-03; rel: 7.992e-04; norm: 2.257e+00; mom: 2.304e-02;
## best it: 13; best obj: 1.177e+01
## It: 55; obj: 1.212e+01; abs: 8.954e-03; rel: 7.381e-04; norm: 2.256e+00; mom: 2.098e-02;
## best it: 13; best obj: 1.177e+01
## It: 56; obj: 1.211e+01; abs: 8.268e-03; rel: 6.820e-04; norm: 2.254e+00; mom: 1.913e-02;
## best it: 13; best obj: 1.177e+01
## It: 57; obj: 1.211e+01; abs: 7.639e-03; rel: 6.306e-04; norm: 2.253e+00; mom: 1.749e-02;
## best it: 13; best obj: 1.177e+01
## It: 58; obj: 1.210e+01; abs: 7.063e-03; rel: 5.834e-04; norm: 2.251e+00; mom: 1.601e-02;
## best it: 13; best obj: 1.177e+01
## It: 59; obj: 1.209e+01; abs: 6.533e-03; rel: 5.400e-04; norm: 2.250e+00; mom: 1.469e-02;
## best it: 13; best obj: 1.177e+01
## It: 60; obj: 1.209e+01; abs: 6.047e-03; rel: 5.000e-04; norm: 2.249e+00; mom: 1.350e-02;
## best it: 13; best obj: 1.177e+01

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## It: 61; obj: 1.208e+01; abs: 5.599e-03; rel: 4.632e-04; norm: 2.248e+00; mom: 1.244e-02;
## best it: 13; best obj: 1.177e+01
## It: 62; obj: 1.208e+01; abs: 5.187e-03; rel: 4.293e-04; norm: 2.247e+00; mom: 1.148e-02;
## best it: 13; best obj: 1.177e+01
## It: 63; obj: 1.207e+01; abs: 4.808e-03; rel: 3.981e-04; norm: 2.246e+00; mom: 1.062e-02;
## best it: 13; best obj: 1.177e+01
## It: 64; obj: 1.207e+01; abs: 4.458e-03; rel: 3.693e-04; norm: 2.245e+00; mom: 9.842e-03;
## best it: 13; best obj: 1.177e+01
## It: 65; obj: 1.206e+01; abs: 4.135e-03; rel: 3.426e-04; norm: 2.244e+00; mom: 9.144e-03;
## best it: 13; best obj: 1.177e+01
## It: 66; obj: 1.206e+01; abs: 3.836e-03; rel: 3.180e-04; norm: 2.243e+00; mom: 8.516e-03;
## best it: 13; best obj: 1.177e+01
## It: 67; obj: 1.206e+01; abs: 3.561e-03; rel: 2.953e-04; norm: 2.243e+00; mom: 7.951e-03;
## best it: 13; best obj: 1.177e+01
## It: 68; obj: 1.205e+01; abs: 3.306e-03; rel: 2.743e-04; norm: 2.242e+00; mom: 7.444e-03;
## best it: 13; best obj: 1.177e+01
## It: 69; obj: 1.205e+01; abs: 3.071e-03; rel: 2.548e-04; norm: 2.241e+00; mom: 6.988e-03;
## best it: 13; best obj: 1.177e+01
## It: 70; obj: 1.205e+01; abs: 2.853e-03; rel: 2.368e-04; norm: 2.241e+00; mom: 6.578e-03;
## best it: 13; best obj: 1.177e+01
## It: 71; obj: 1.204e+01; abs: 2.652e-03; rel: 2.201e-04; norm: 2.240e+00; mom: 6.211e-03;
## best it: 13; best obj: 1.177e+01
## It: 72; obj: 1.204e+01; abs: 2.465e-03; rel: 2.047e-04; norm: 2.240e+00; mom: 5.883e-03;
## best it: 13; best obj: 1.177e+01
## It: 73; obj: 1.204e+01; abs: 2.292e-03; rel: 1.904e-04; norm: 2.240e+00; mom: 5.588e-03;
## best it: 13; best obj: 1.177e+01
## It: 74; obj: 1.204e+01; abs: 2.132e-03; rel: 1.771e-04; norm: 2.239e+00; mom: 5.326e-03;
## best it: 13; best obj: 1.177e+01
## It: 75; obj: 1.203e+01; abs: 1.984e-03; rel: 1.648e-04; norm: 2.239e+00; mom: 5.091e-03;
## best it: 13; best obj: 1.177e+01

## It: 76; obj: 1.203e+01; abs: 1.847e-03; rel: 1.534e-04; norm: 2.239e+00; mom: 4.882e-03;
## best it: 13; best obj: 1.177e+01
## It: 77; obj: 1.203e+01; abs: 1.719e-03; rel: 1.429e-04; norm: 2.238e+00; mom: 4.696e-03;
## best it: 13; best obj: 1.177e+01
## It: 78; obj: 1.203e+01; abs: 1.601e-03; rel: 1.331e-04; norm: 2.238e+00; mom: 4.531e-03;
## best it: 13; best obj: 1.177e+01
## It: 79; obj: 1.203e+01; abs: 1.491e-03; rel: 1.240e-04; norm: 2.238e+00; mom: 4.383e-03;
## best it: 13; best obj: 1.177e+01
## It: 80; obj: 1.203e+01; abs: 1.389e-03; rel: 1.155e-04; norm: 2.238e+00; mom: 4.253e-03;
## best it: 13; best obj: 1.177e+01
## It: 81; obj: 1.203e+01; abs: 1.295e-03; rel: 1.077e-04; norm: 2.237e+00; mom: 4.136e-03;
## best it: 13; best obj: 1.177e+01
## It: 82; obj: 1.202e+01; abs: 1.208e-03; rel: 1.004e-04; norm: 2.237e+00; mom: 4.033e-03;
## best it: 13; best obj: 1.177e+01
## It: 83; obj: 1.202e+01; abs: 1.126e-03; rel: 9.366e-05; norm: 2.237e+00; mom: 3.941e-03;
## best it: 13; best obj: 1.177e+01
## It: 84; obj: 1.202e+01; abs: 1.051e-03; rel: 8.739e-05; norm: 2.237e+00; mom: 3.859e-03;
## best it: 13; best obj: 1.177e+01
## It: 85; obj: 1.202e+01; abs: 9.807e-04; rel: 8.157e-05; norm: 2.237e+00; mom: 3.786e-03;
## best it: 13; best obj: 1.177e+01
## It: 86; obj: 1.202e+01; abs: 9.156e-04; rel: 7.617e-05; norm: 2.237e+00; mom: 3.721e-03;
## best it: 13; best obj: 1.177e+01
## It: 87; obj: 1.202e+01; abs: 8.552e-04; rel: 7.115e-05; norm: 2.237e+00; mom: 3.662e-03;

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## best it: 13; best obj: 1.177e+01
## It: 88; obj: 1.202e+01; abs: 7.991e-04; rel: 6.648e-05; norm: 2.237e+00; mom: 3.610e-03;
## best it: 13; best obj: 1.177e+01
## It: 89; obj: 1.202e+01; abs: 7.470e-04; rel: 6.215e-05; norm: 2.236e+00; mom: 3.563e-03;
## best it: 13; best obj: 1.177e+01
## It: 90; obj: 1.202e+01; abs: 6.986e-04; rel: 5.813e-05; norm: 2.236e+00; mom: 3.521e-03;
## best it: 13; best obj: 1.177e+01
## It: 91; obj: 1.202e+01; abs: 6.536e-04; rel: 5.439e-05; norm: 2.236e+00; mom: 3.483e-03;
## best it: 13; best obj: 1.177e+01
## It: 92; obj: 1.202e+01; abs: 6.118e-04; rel: 5.091e-05; norm: 2.236e+00; mom: 3.448e-03;
## best it: 13; best obj: 1.177e+01
## It: 93; obj: 1.202e+01; abs: 5.729e-04; rel: 4.768e-05; norm: 2.236e+00; mom: 3.417e-03;
## best it: 13; best obj: 1.177e+01
## It: 94; obj: 1.201e+01; abs: 5.368e-04; rel: 4.468e-05; norm: 2.236e+00; mom: 3.388e-03;
## best it: 13; best obj: 1.177e+01
## It: 95; obj: 1.201e+01; abs: 5.033e-04; rel: 4.189e-05; norm: 2.236e+00; mom: 3.361e-03;
## best it: 13; best obj: 1.177e+01
## It: 96; obj: 1.201e+01; abs: 4.721e-04; rel: 3.930e-05; norm: 2.236e+00; mom: 3.337e-03;
## best it: 13; best obj: 1.177e+01
## It: 97; obj: 1.201e+01; abs: 4.431e-04; rel: 3.689e-05; norm: 2.236e+00; mom: 3.314e-03;
## best it: 13; best obj: 1.177e+01
## It: 98; obj: 1.201e+01; abs: 4.162e-04; rel: 3.464e-05; norm: 2.236e+00; mom: 3.294e-03;
## best it: 13; best obj: 1.177e+01
## It: 99; obj: 1.201e+01; abs: 3.911e-04; rel: 3.256e-05; norm: 2.236e+00; mom: 3.274e-03;
## best it: 13; best obj: 1.177e+01
## It: 100; obj: 1.201e+01; abs: 3.679e-04; rel: 3.062e-05; norm: 2.236e+00; mom: 3.256e-03;
## best it: 13; best obj: 1.177e+01

## It: 101; obj: 1.415e+00; abs: 1.060e+01; rel: 8.822e-01; norm: 1.882e-01; mom: 3.238e-03;
## best it: 101; best obj: 1.415e+00
## It: 102; obj: 1.253e+00; abs: 1.619e-01; rel: 1.144e-01; norm: 1.767e-01; mom: 2.174e+00;
## best it: 102; best obj: 1.253e+00
## It: 103; obj: 1.200e+00; abs: 5.312e-02; rel: 4.238e-02; norm: 1.855e-01; mom: 1.953e+00;
## best it: 103; best obj: 1.200e+00
## It: 104; obj: 1.192e+00; abs: 8.705e-03; rel: 7.252e-03; norm: 1.918e-01; mom: 8.843e-01;
## best it: 104; best obj: 1.192e+00
## It: 105; obj: 1.187e+00; abs: 4.256e-03; rel: 3.572e-03; norm: 1.936e-01; mom: 1.207e+00;
## best it: 105; best obj: 1.187e+00
## It: 106; obj: 1.175e+00; abs: 1.194e-02; rel: 1.005e-02; norm: 1.942e-01; mom: 1.015e+00;
## best it: 106; best obj: 1.175e+00
## It: 107; obj: 1.176e+00; abs: 1.008e-03; rel: 8.573e-04; norm: 1.934e-01; mom: 1.100e+00;
## best it: 106; best obj: 1.175e+00
## It: 108; obj: 1.186e+00; abs: 9.831e-03; rel: 8.356e-03; norm: 1.930e-01; mom: 7.123e-01;
## best it: 106; best obj: 1.175e+00
## It: 109; obj: 1.186e+00; abs: 2.209e-04; rel: 1.862e-04; norm: 1.930e-01; mom: 1.234e+00;
## best it: 106; best obj: 1.175e+00
## It: 110; obj: 1.175e+00; abs: 1.090e-02; rel: 9.186e-03; norm: 1.931e-01; mom: 1.325e+00;
## best it: 110; best obj: 1.175e+00
## It: 111; obj: 1.178e+00; abs: 3.308e-03; rel: 2.815e-03; norm: 1.931e-01; mom: 1.355e+00;
## best it: 110; best obj: 1.175e+00
## It: 112; obj: 1.178e+00; abs: 6.468e-04; rel: 5.488e-04; norm: 1.930e-01; mom: 1.002e+00;
## best it: 110; best obj: 1.175e+00
## It: 113; obj: 1.181e+00; abs: 2.860e-03; rel: 2.428e-03; norm: 1.930e-01; mom: 8.600e-01;
## best it: 110; best obj: 1.175e+00

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## It: 114; obj: 1.182e+00; abs: 1.673e-03; rel: 1.417e-03; norm: 1.926e-01; mom: 7.093e-01;
## best it: 110; best obj: 1.175e+00
## It: 115; obj: 1.173e+00; abs: 9.217e-03; rel: 7.795e-03; norm: 1.929e-01; mom: 1.190e+00;
## best it: 115; best obj: 1.173e+00
## It: 116; obj: 1.175e+00; abs: 1.786e-03; rel: 1.522e-03; norm: 1.930e-01; mom: 7.610e-01;
## best it: 115; best obj: 1.173e+00
## It: 117; obj: 1.180e+00; abs: 5.012e-03; rel: 4.266e-03; norm: 1.926e-01; mom: 8.820e-01;
## best it: 115; best obj: 1.173e+00
## It: 118; obj: 1.186e+00; abs: 6.286e-03; rel: 5.328e-03; norm: 1.925e-01; mom: 7.737e-01;
## best it: 115; best obj: 1.173e+00
## It: 119; obj: 1.172e+00; abs: 1.420e-02; rel: 1.197e-02; norm: 1.929e-01; mom: 1.365e+00;
## best it: 119; best obj: 1.172e+00
## It: 120; obj: 1.174e+00; abs: 1.976e-03; rel: 1.686e-03; norm: 1.931e-01; mom: 1.253e+00;
## best it: 119; best obj: 1.172e+00
## It: 121; obj: 1.176e+00; abs: 1.894e-03; rel: 1.614e-03; norm: 1.927e-01; mom: 9.040e-01;
## best it: 119; best obj: 1.172e+00
## It: 122; obj: 1.177e+00; abs: 8.310e-04; rel: 7.067e-04; norm: 1.926e-01; mom: 3.980e-01;
## best it: 119; best obj: 1.172e+00
## It: 123; obj: 1.179e+00; abs: 2.512e-03; rel: 2.135e-03; norm: 1.922e-01; mom: 1.123e+00;
## best it: 119; best obj: 1.172e+00
## It: 124; obj: 1.183e+00; abs: 3.466e-03; rel: 2.939e-03; norm: 1.926e-01; mom: 7.303e-01;
## best it: 119; best obj: 1.172e+00
## It: 125; obj: 1.177e+00; abs: 5.718e-03; rel: 4.834e-03; norm: 1.924e-01; mom: 1.340e+00;
## best it: 119; best obj: 1.172e+00

## It: 126; obj: 1.176e+00; abs: 1.474e-03; rel: 1.252e-03; norm: 1.927e-01; mom: 8.557e-01;
## best it: 119; best obj: 1.172e+00
## It: 127; obj: 1.181e+00; abs: 5.526e-03; rel: 4.701e-03; norm: 1.925e-01; mom: 9.870e-01;
## best it: 119; best obj: 1.172e+00
## It: 128; obj: 1.181e+00; abs: 1.040e-04; rel: 8.808e-05; norm: 1.926e-01; mom: 1.097e+00;
## best it: 119; best obj: 1.172e+00
## It: 129; obj: 1.180e+00; abs: 1.133e-03; rel: 9.591e-04; norm: 1.932e-01; mom: 1.242e+00;
## best it: 119; best obj: 1.172e+00
## It: 130; obj: 1.181e+00; abs: 8.636e-04; rel: 7.320e-04; norm: 1.926e-01; mom: 5.757e-01;
## best it: 119; best obj: 1.172e+00
## It: 131; obj: 1.176e+00; abs: 5.134e-03; rel: 4.348e-03; norm: 1.929e-01; mom: 1.218e+00;
## best it: 119; best obj: 1.172e+00
## It: 132; obj: 1.177e+00; abs: 1.889e-03; rel: 1.607e-03; norm: 1.931e-01; mom: 1.001e+00;
## best it: 119; best obj: 1.172e+00
## It: 133; obj: 1.180e+00; abs: 2.196e-03; rel: 1.865e-03; norm: 1.926e-01; mom: 1.137e+00;
## best it: 119; best obj: 1.172e+00
## It: 134; obj: 1.178e+00; abs: 1.264e-03; rel: 1.072e-03; norm: 1.928e-01; mom: 9.910e-01;
## best it: 119; best obj: 1.172e+00
## It: 135; obj: 1.181e+00; abs: 3.049e-03; rel: 2.587e-03; norm: 1.930e-01; mom: 1.289e+00;
## best it: 119; best obj: 1.172e+00
## It: 136; obj: 1.180e+00; abs: 1.068e-03; rel: 9.044e-04; norm: 1.928e-01; mom: 1.150e+00;
## best it: 119; best obj: 1.172e+00
## It: 137; obj: 1.176e+00; abs: 4.645e-03; rel: 3.935e-03; norm: 1.929e-01; mom: 1.207e+00;
## best it: 119; best obj: 1.172e+00
## It: 138; obj: 1.179e+00; abs: 3.124e-03; rel: 2.658e-03; norm: 1.927e-01; mom: 1.106e+00;
## best it: 119; best obj: 1.172e+00
## It: 139; obj: 1.180e+00; abs: 8.204e-04; rel: 6.959e-04; norm: 1.925e-01; mom: 6.316e-01;
## best it: 119; best obj: 1.172e+00
## It: 140; obj: 1.176e+00; abs: 3.492e-03; rel: 2.960e-03; norm: 1.925e-01; mom: 1.178e+00;

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## best it: 119; best obj: 1.172e+00
## It: 141; obj: 1.182e+00; abs: 5.458e-03; rel: 4.640e-03; norm: 1.928e-01; mom: 8.908e-01;
## best it: 119; best obj: 1.172e+00
## It: 142; obj: 1.180e+00; abs: 1.794e-03; rel: 1.518e-03; norm: 1.925e-01; mom: 1.228e+00;
## best it: 119; best obj: 1.172e+00
## It: 143; obj: 1.172e+00; abs: 8.058e-03; rel: 6.830e-03; norm: 1.930e-01; mom: 1.202e+00;
## best it: 143; best obj: 1.172e+00
## It: 144; obj: 1.173e+00; abs: 1.731e-03; rel: 1.477e-03; norm: 1.925e-01; mom: 1.135e+00;
## best it: 143; best obj: 1.172e+00
## It: 145; obj: 1.183e+00; abs: 9.605e-03; rel: 8.185e-03; norm: 1.923e-01; mom: 7.189e-01;
## best it: 143; best obj: 1.172e+00
## It: 146; obj: 1.179e+00; abs: 4.530e-03; rel: 3.829e-03; norm: 1.932e-01; mom: 1.028e+00;
## best it: 143; best obj: 1.172e+00
## It: 147; obj: 1.174e+00; abs: 5.020e-03; rel: 4.259e-03; norm: 1.928e-01; mom: 1.148e+00;
## best it: 143; best obj: 1.172e+00
## It: 148; obj: 1.177e+00; abs: 3.792e-03; rel: 3.232e-03; norm: 1.927e-01; mom: 9.870e-01;
## best it: 143; best obj: 1.172e+00
## It: 149; obj: 1.178e+00; abs: 2.861e-04; rel: 2.430e-04; norm: 1.927e-01; mom: 9.550e-01;
## best it: 143; best obj: 1.172e+00
## It: 150; obj: 1.172e+00; abs: 5.969e-03; rel: 5.069e-03; norm: 1.930e-01; mom: 9.754e-01;
## best it: 150; best obj: 1.172e+00

## It: 151; obj: 1.175e+00; abs: 3.092e-03; rel: 2.639e-03; norm: 1.924e-01; mom: 8.563e-01;
## best it: 150; best obj: 1.172e+00
## It: 152; obj: 1.184e+00; abs: 9.363e-03; rel: 7.971e-03; norm: 1.920e-01; mom: 7.670e-01;
## best it: 150; best obj: 1.172e+00
## It: 153; obj: 1.177e+00; abs: 7.143e-03; rel: 6.033e-03; norm: 1.929e-01; mom: 1.062e+00;
## best it: 150; best obj: 1.172e+00
## It: 154; obj: 1.172e+00; abs: 5.019e-03; rel: 4.264e-03; norm: 1.927e-01; mom: 1.239e+00;
## best it: 150; best obj: 1.172e+00
## It: 155; obj: 1.174e+00; abs: 2.520e-03; rel: 2.150e-03; norm: 1.930e-01; mom: 9.911e-01;
## best it: 150; best obj: 1.172e+00
## It: 156; obj: 1.176e+00; abs: 1.325e-03; rel: 1.128e-03; norm: 1.926e-01; mom: 8.245e-01;
## best it: 150; best obj: 1.172e+00
## It: 157; obj: 1.184e+00; abs: 8.062e-03; rel: 6.857e-03; norm: 1.925e-01; mom: 6.100e-01;
## best it: 150; best obj: 1.172e+00
## It: 158; obj: 1.180e+00; abs: 3.969e-03; rel: 3.353e-03; norm: 1.926e-01; mom: 1.033e+00;
## best it: 150; best obj: 1.172e+00
## It: 159; obj: 1.174e+00; abs: 5.642e-03; rel: 4.782e-03; norm: 1.926e-01; mom: 1.022e+00;
## best it: 150; best obj: 1.172e+00
## It: 160; obj: 1.176e+00; abs: 1.763e-03; rel: 1.501e-03; norm: 1.925e-01; mom: 9.204e-01;
## best it: 150; best obj: 1.172e+00
## It: 161; obj: 1.180e+00; abs: 3.629e-03; rel: 3.086e-03; norm: 1.923e-01; mom: 9.469e-01;
## best it: 150; best obj: 1.172e+00
## It: 162; obj: 1.186e+00; abs: 6.037e-03; rel: 5.117e-03; norm: 1.928e-01; mom: 1.000e+00;
## best it: 150; best obj: 1.172e+00
## It: 163; obj: 1.177e+00; abs: 8.448e-03; rel: 7.125e-03; norm: 1.926e-01; mom: 9.810e-01;
## best it: 150; best obj: 1.172e+00
## It: 164; obj: 1.172e+00; abs: 5.654e-03; rel: 4.803e-03; norm: 1.929e-01; mom: 1.335e+00;
## best it: 164; best obj: 1.172e+00
## It: 165; obj: 1.173e+00; abs: 1.666e-03; rel: 1.422e-03; norm: 1.924e-01; mom: 5.729e-01;
## best it: 164; best obj: 1.172e+00
## It: 166; obj: 1.180e+00; abs: 6.538e-03; rel: 5.573e-03; norm: 1.928e-01; mom: 7.733e-01;
## best it: 164; best obj: 1.172e+00

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## It: 167; obj: 1.179e+00; abs: 8.823e-04; rel: 7.479e-04; norm: 1.925e-01; mom: 6.941e-01;
## best it: 164; best obj: 1.172e+00
## It: 168; obj: 1.178e+00; abs: 9.892e-04; rel: 8.391e-04; norm: 1.930e-01; mom: 1.206e+00;
## best it: 164; best obj: 1.172e+00
## It: 169; obj: 1.182e+00; abs: 4.058e-03; rel: 3.445e-03; norm: 1.929e-01; mom: 1.130e+00;
## best it: 164; best obj: 1.172e+00
## It: 170; obj: 1.175e+00; abs: 6.915e-03; rel: 5.851e-03; norm: 1.927e-01; mom: 1.034e+00;
## best it: 164; best obj: 1.172e+00
## It: 171; obj: 1.178e+00; abs: 3.340e-03; rel: 2.842e-03; norm: 1.928e-01; mom: 1.085e+00;
## best it: 164; best obj: 1.172e+00
## It: 172; obj: 1.182e+00; abs: 3.611e-03; rel: 3.065e-03; norm: 1.923e-01; mom: 9.497e-01;
## best it: 164; best obj: 1.172e+00
## It: 173; obj: 1.177e+00; abs: 4.796e-03; rel: 4.057e-03; norm: 1.930e-01; mom: 1.361e+00;
## best it: 164; best obj: 1.172e+00
## It: 174; obj: 1.177e+00; abs: 3.228e-04; rel: 2.742e-04; norm: 1.930e-01; mom: 1.429e+00;
## best it: 164; best obj: 1.172e+00
## It: 175; obj: 1.175e+00; abs: 1.462e-03; rel: 1.243e-03; norm: 1.925e-01; mom: 9.708e-01;
## best it: 164; best obj: 1.172e+00
## It: 176; obj: 1.176e+00; abs: 6.200e-04; rel: 5.275e-04; norm: 1.925e-01; mom: 1.075e+00;
## best it: 164; best obj: 1.172e+00
## It: 177; obj: 1.182e+00; abs: 6.077e-03; rel: 5.167e-03; norm: 1.921e-01; mom: 9.726e-01;
## best it: 164; best obj: 1.172e+00
## It: 178; obj: 1.174e+00; abs: 7.816e-03; rel: 6.612e-03; norm: 1.930e-01; mom: 1.152e+00;
## best it: 164; best obj: 1.172e+00
## It: 179; obj: 1.173e+00; abs: 1.534e-03; rel: 1.307e-03; norm: 1.927e-01; mom: 1.190e+00;
## best it: 164; best obj: 1.172e+00
## It: 180; obj: 1.183e+00; abs: 1.051e-02; rel: 8.965e-03; norm: 1.924e-01; mom: 7.649e-01;
## best it: 164; best obj: 1.172e+00
## It: 181; obj: 1.182e+00; abs: 8.626e-04; rel: 7.290e-04; norm: 1.930e-01; mom: 1.134e+00;
## best it: 164; best obj: 1.172e+00
## It: 182; obj: 1.174e+00; abs: 8.569e-03; rel: 7.247e-03; norm: 1.928e-01; mom: 1.275e+00;
## best it: 164; best obj: 1.172e+00
## It: 183; obj: 1.175e+00; abs: 1.187e-03; rel: 1.011e-03; norm: 1.928e-01; mom: 9.891e-01;
## best it: 164; best obj: 1.172e+00
## It: 184; obj: 1.177e+00; abs: 1.758e-03; rel: 1.496e-03; norm: 1.930e-01; mom: 1.153e+00;
## best it: 164; best obj: 1.172e+00
## It: 185; obj: 1.179e+00; abs: 2.197e-03; rel: 1.867e-03; norm: 1.928e-01; mom: 6.734e-01;
## best it: 164; best obj: 1.172e+00
## It: 186; obj: 1.173e+00; abs: 6.173e-03; rel: 5.236e-03; norm: 1.924e-01; mom: 1.162e+00;
## best it: 164; best obj: 1.172e+00
## It: 187; obj: 1.178e+00; abs: 5.552e-03; rel: 4.734e-03; norm: 1.930e-01; mom: 9.729e-01;
## best it: 164; best obj: 1.172e+00
## It: 188; obj: 1.172e+00; abs: 6.010e-03; rel: 5.101e-03; norm: 1.929e-01; mom: 8.224e-01;
## best it: 164; best obj: 1.172e+00
## It: 189; obj: 1.172e+00; abs: 3.199e-04; rel: 2.729e-04; norm: 1.926e-01; mom: 9.983e-01;
## best it: 164; best obj: 1.172e+00
## It: 190; obj: 1.173e+00; abs: 1.122e-03; rel: 9.573e-04; norm: 1.927e-01; mom: 4.804e-01;
## best it: 164; best obj: 1.172e+00
## It: 191; obj: 1.175e+00; abs: 1.486e-03; rel: 1.267e-03; norm: 1.926e-01; mom: 9.880e-01;
## best it: 164; best obj: 1.172e+00
## It: 192; obj: 1.178e+00; abs: 3.516e-03; rel: 2.993e-03; norm: 1.923e-01; mom: 4.627e-01;
## best it: 164; best obj: 1.172e+00
## It: 193; obj: 1.174e+00; abs: 3.791e-03; rel: 3.218e-03; norm: 1.927e-01; mom: 1.052e+00;

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## best it: 164; best obj: 1.172e+00
## It: 194; obj: 1.180e+00; abs: 5.193e-03; rel: 4.422e-03; norm: 1.926e-01; mom: 1.199e+00;
## best it: 164; best obj: 1.172e+00
## It: 195; obj: 1.179e+00; abs: 1.881e-04; rel: 1.595e-04; norm: 1.927e-01; mom: 7.685e-01;
## best it: 164; best obj: 1.172e+00
## It: 196; obj: 1.179e+00; abs: 5.056e-04; rel: 4.287e-04; norm: 1.925e-01; mom: 1.229e+00;
## best it: 164; best obj: 1.172e+00
## It: 197; obj: 1.174e+00; abs: 4.765e-03; rel: 4.042e-03; norm: 1.929e-01; mom: 1.061e+00;
## best it: 164; best obj: 1.172e+00
## It: 198; obj: 1.183e+00; abs: 8.749e-03; rel: 7.452e-03; norm: 1.925e-01; mom: 9.814e-01;
## best it: 164; best obj: 1.172e+00
## It: 199; obj: 1.180e+00; abs: 2.465e-03; rel: 2.084e-03; norm: 1.931e-01; mom: 1.100e+00;
## best it: 164; best obj: 1.172e+00
## It: 200; obj: 1.177e+00; abs: 3.628e-03; rel: 3.074e-03; norm: 1.930e-01; mom: 1.155e+00;
## best it: 164; best obj: 1.172e+00

## It: 201; obj: 1.176e+00; abs: 6.019e-04; rel: 5.115e-04; norm: 1.927e-01; mom: 1.080e+00;
## best it: 164; best obj: 1.172e+00
## It: 202; obj: 1.179e+00; abs: 3.084e-03; rel: 2.622e-03; norm: 1.924e-01; mom: 1.089e+00;
## best it: 164; best obj: 1.172e+00
## It: 203; obj: 1.178e+00; abs: 1.239e-03; rel: 1.051e-03; norm: 1.926e-01; mom: 6.625e-01;
## best it: 164; best obj: 1.172e+00
## It: 204; obj: 1.176e+00; abs: 2.060e-03; rel: 1.749e-03; norm: 1.927e-01; mom: 1.053e+00;
## best it: 164; best obj: 1.172e+00
## It: 205; obj: 1.178e+00; abs: 1.642e-03; rel: 1.396e-03; norm: 1.927e-01; mom: 9.295e-01;
## best it: 164; best obj: 1.172e+00
## It: 206; obj: 1.176e+00; abs: 1.544e-03; rel: 1.311e-03; norm: 1.928e-01; mom: 9.455e-01;
## best it: 164; best obj: 1.172e+00
## It: 207; obj: 1.179e+00; abs: 2.909e-03; rel: 2.474e-03; norm: 1.928e-01; mom: 6.154e-01;
## best it: 164; best obj: 1.172e+00
## It: 208; obj: 1.181e+00; abs: 2.139e-03; rel: 1.814e-03; norm: 1.925e-01; mom: 1.442e+00;
## best it: 164; best obj: 1.172e+00
## It: 209; obj: 1.173e+00; abs: 8.328e-03; rel: 7.051e-03; norm: 1.932e-01; mom: 7.352e-01;
## best it: 164; best obj: 1.172e+00
## It: 210; obj: 1.170e+00; abs: 2.394e-03; rel: 2.041e-03; norm: 1.925e-01; mom: 1.308e+00;
## best it: 210; best obj: 1.170e+00
## It: 211; obj: 1.174e+00; abs: 3.964e-03; rel: 3.387e-03; norm: 1.926e-01; mom: 4.689e-01;
## best it: 210; best obj: 1.170e+00
## It: 212; obj: 1.182e+00; abs: 7.961e-03; rel: 6.779e-03; norm: 1.924e-01; mom: 7.501e-01;
## best it: 210; best obj: 1.170e+00
## It: 213; obj: 1.173e+00; abs: 8.881e-03; rel: 7.512e-03; norm: 1.928e-01; mom: 1.159e+00;
## best it: 210; best obj: 1.170e+00
## It: 214; obj: 1.175e+00; abs: 1.247e-03; rel: 1.063e-03; norm: 1.928e-01; mom: 1.272e+00;
## best it: 210; best obj: 1.170e+00
## It: 215; obj: 1.176e+00; abs: 1.055e-03; rel: 8.985e-04; norm: 1.927e-01; mom: 9.486e-01;
## best it: 210; best obj: 1.170e+00
## It: 216; obj: 1.176e+00; abs: 2.255e-04; rel: 1.918e-04; norm: 1.926e-01; mom: 7.499e-01;
## best it: 210; best obj: 1.170e+00
## It: 217; obj: 1.176e+00; abs: 2.587e-04; rel: 2.200e-04; norm: 1.922e-01; mom: 9.565e-01;
## best it: 210; best obj: 1.170e+00
## It: 218; obj: 1.180e+00; abs: 4.756e-03; rel: 4.046e-03; norm: 1.927e-01; mom: 9.729e-01;
## best it: 210; best obj: 1.170e+00
## It: 219; obj: 1.177e+00; abs: 3.638e-03; rel: 3.082e-03; norm: 1.929e-01; mom: 7.210e-01;
## best it: 210; best obj: 1.170e+00

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## It: 220; obj: 1.171e+00; abs: 5.564e-03; rel: 4.728e-03; norm: 1.929e-01; mom: 1.305e+00;
## best it: 210; best obj: 1.170e+00
## It: 221; obj: 1.175e+00; abs: 3.980e-03; rel: 3.398e-03; norm: 1.927e-01; mom: 9.593e-01;
## best it: 210; best obj: 1.170e+00
## It: 222; obj: 1.183e+00; abs: 7.960e-03; rel: 6.773e-03; norm: 1.925e-01; mom: 9.875e-01;
## best it: 210; best obj: 1.170e+00
## It: 223; obj: 1.181e+00; abs: 2.590e-03; rel: 2.189e-03; norm: 1.931e-01; mom: 9.906e-01;
## best it: 210; best obj: 1.170e+00
## It: 224; obj: 1.172e+00; abs: 8.605e-03; rel: 7.289e-03; norm: 1.924e-01; mom: 1.329e+00;
## best it: 210; best obj: 1.170e+00
## It: 225; obj: 1.173e+00; abs: 8.376e-04; rel: 7.147e-04; norm: 1.928e-01; mom: 8.434e-01;
## best it: 210; best obj: 1.170e+00

## It: 226; obj: 1.174e+00; abs: 1.354e-03; rel: 1.155e-03; norm: 1.926e-01; mom: 6.952e-01;
## best it: 210; best obj: 1.170e+00
## It: 227; obj: 1.175e+00; abs: 3.857e-04; rel: 3.285e-04; norm: 1.928e-01; mom: 8.352e-01;
## best it: 210; best obj: 1.170e+00
## It: 228; obj: 1.181e+00; abs: 6.732e-03; rel: 5.731e-03; norm: 1.924e-01; mom: 6.043e-01;
## best it: 210; best obj: 1.170e+00
## It: 229; obj: 1.178e+00; abs: 2.960e-03; rel: 2.505e-03; norm: 1.928e-01; mom: 1.332e+00;
## best it: 210; best obj: 1.170e+00
## It: 230; obj: 1.178e+00; abs: 6.514e-04; rel: 5.528e-04; norm: 1.926e-01; mom: 8.982e-01;
## best it: 210; best obj: 1.170e+00
## It: 231; obj: 1.171e+00; abs: 6.232e-03; rel: 5.292e-03; norm: 1.925e-01; mom: 1.085e+00;
## best it: 210; best obj: 1.170e+00
## It: 232; obj: 1.170e+00; abs: 1.088e-03; rel: 9.289e-04; norm: 1.926e-01; mom: 1.086e+00;
## best it: 232; best obj: 1.170e+00
## It: 233; obj: 1.173e+00; abs: 2.290e-03; rel: 1.956e-03; norm: 1.927e-01; mom: 3.101e-01;
## best it: 232; best obj: 1.170e+00
## It: 234; obj: 1.180e+00; abs: 6.936e-03; rel: 5.915e-03; norm: 1.926e-01; mom: 6.212e-01;
## best it: 232; best obj: 1.170e+00
## It: 235; obj: 1.182e+00; abs: 2.578e-03; rel: 2.185e-03; norm: 1.926e-01; mom: 8.189e-01;
## best it: 232; best obj: 1.170e+00
## It: 236; obj: 1.179e+00; abs: 2.859e-03; rel: 2.418e-03; norm: 1.928e-01; mom: 1.113e+00;
## best it: 232; best obj: 1.170e+00
## It: 237; obj: 1.176e+00; abs: 3.372e-03; rel: 2.860e-03; norm: 1.927e-01; mom: 9.517e-01;
## best it: 232; best obj: 1.170e+00
## It: 238; obj: 1.173e+00; abs: 2.418e-03; rel: 2.056e-03; norm: 1.927e-01; mom: 1.285e+00;
## best it: 232; best obj: 1.170e+00
## It: 239; obj: 1.171e+00; abs: 2.262e-03; rel: 1.927e-03; norm: 1.928e-01; mom: 3.115e-01;
## best it: 232; best obj: 1.170e+00
## It: 240; obj: 1.175e+00; abs: 3.402e-03; rel: 2.905e-03; norm: 1.923e-01; mom: 7.986e-01;
## best it: 232; best obj: 1.170e+00
## It: 241; obj: 1.183e+00; abs: 8.797e-03; rel: 7.489e-03; norm: 1.926e-01; mom: 5.733e-01;
## best it: 232; best obj: 1.170e+00
## It: 242; obj: 1.175e+00; abs: 8.725e-03; rel: 7.372e-03; norm: 1.927e-01; mom: 1.128e+00;
## best it: 232; best obj: 1.170e+00
## It: 243; obj: 1.176e+00; abs: 1.425e-03; rel: 1.213e-03; norm: 1.927e-01; mom: 1.141e+00;
## best it: 232; best obj: 1.170e+00
## It: 244; obj: 1.178e+00; abs: 1.972e-03; rel: 1.676e-03; norm: 1.924e-01; mom: 1.024e+00;
## best it: 232; best obj: 1.170e+00
## It: 245; obj: 1.176e+00; abs: 2.277e-03; rel: 1.932e-03; norm: 1.928e-01; mom: 9.475e-01;
## best it: 232; best obj: 1.170e+00
## It: 246; obj: 1.172e+00; abs: 3.697e-03; rel: 3.144e-03; norm: 1.928e-01; mom: 8.528e-01;

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## best it: 232; best obj: 1.170e+00
## It: 247; obj: 1.173e+00; abs: 9.248e-04; rel: 7.890e-04; norm: 1.925e-01; mom: 8.843e-01;
## best it: 232; best obj: 1.170e+00
## It: 248; obj: 1.186e+00; abs: 1.284e-02; rel: 1.094e-02; norm: 1.923e-01; mom: 1.140e+00;
## best it: 232; best obj: 1.170e+00
## It: 249; obj: 1.184e+00; abs: 1.706e-03; rel: 1.438e-03; norm: 1.929e-01; mom: 1.890e+00;
## best it: 232; best obj: 1.170e+00
## It: 250; obj: 1.174e+00; abs: 9.699e-03; rel: 8.190e-03; norm: 1.933e-01; mom: 1.628e+00;
## best it: 232; best obj: 1.170e+00

## It: 251; obj: 1.171e+00; abs: 3.160e-03; rel: 2.690e-03; norm: 1.928e-01; mom: 1.668e+00;
## best it: 232; best obj: 1.170e+00
## It: 252; obj: 1.178e+00; abs: 6.458e-03; rel: 5.513e-03; norm: 1.928e-01; mom: 1.061e+00;
## best it: 232; best obj: 1.170e+00
## It: 253; obj: 1.182e+00; abs: 4.648e-03; rel: 3.946e-03; norm: 1.927e-01; mom: 1.248e+00;
## best it: 232; best obj: 1.170e+00
## It: 254; obj: 1.178e+00; abs: 4.680e-03; rel: 3.958e-03; norm: 1.927e-01; mom: 1.432e+00;
## best it: 232; best obj: 1.170e+00
## It: 255; obj: 1.175e+00; abs: 2.456e-03; rel: 2.086e-03; norm: 1.927e-01; mom: 1.394e+00;
## best it: 232; best obj: 1.170e+00
## It: 256; obj: 1.179e+00; abs: 3.499e-03; rel: 2.977e-03; norm: 1.925e-01; mom: 1.751e+00;
## best it: 232; best obj: 1.170e+00
## It: 257; obj: 1.179e+00; abs: 5.463e-04; rel: 4.634e-04; norm: 1.928e-01; mom: 1.495e+00;
## best it: 232; best obj: 1.170e+00
## It: 258; obj: 1.177e+00; abs: 2.276e-03; rel: 1.930e-03; norm: 1.929e-01; mom: 1.270e+00;
## best it: 232; best obj: 1.170e+00
## It: 259; obj: 1.178e+00; abs: 6.249e-04; rel: 5.309e-04; norm: 1.925e-01; mom: 1.501e+00;
## best it: 232; best obj: 1.170e+00
## It: 260; obj: 1.184e+00; abs: 6.029e-03; rel: 5.119e-03; norm: 1.926e-01; mom: 1.397e+00;
## best it: 232; best obj: 1.170e+00
## It: 261; obj: 1.180e+00; abs: 3.556e-03; rel: 3.004e-03; norm: 1.928e-01; mom: 1.640e+00;
## best it: 232; best obj: 1.170e+00
## It: 262; obj: 1.176e+00; abs: 4.316e-03; rel: 3.657e-03; norm: 1.929e-01; mom: 1.378e+00;
## best it: 232; best obj: 1.170e+00
## It: 263; obj: 1.176e+00; abs: 3.833e-04; rel: 3.259e-04; norm: 1.923e-01; mom: 1.330e+00;
## best it: 232; best obj: 1.170e+00
## It: 264; obj: 1.185e+00; abs: 9.232e-03; rel: 7.849e-03; norm: 1.922e-01; mom: 1.241e+00;
## best it: 232; best obj: 1.170e+00
## It: 265; obj: 1.183e+00; abs: 2.265e-03; rel: 1.910e-03; norm: 1.928e-01; mom: 1.648e+00;
## best it: 232; best obj: 1.170e+00
## It: 266; obj: 1.178e+00; abs: 4.810e-03; rel: 4.065e-03; norm: 1.929e-01; mom: 1.461e+00;
## best it: 232; best obj: 1.170e+00
## It: 267; obj: 1.177e+00; abs: 1.472e-03; rel: 1.249e-03; norm: 1.927e-01; mom: 1.415e+00;
## best it: 232; best obj: 1.170e+00
## It: 268; obj: 1.183e+00; abs: 5.648e-03; rel: 4.799e-03; norm: 1.924e-01; mom: 1.574e+00;
## best it: 232; best obj: 1.170e+00
## It: 269; obj: 1.185e+00; abs: 2.844e-03; rel: 2.405e-03; norm: 1.926e-01; mom: 1.621e+00;
## best it: 232; best obj: 1.170e+00
## It: 270; obj: 1.179e+00; abs: 6.105e-03; rel: 5.150e-03; norm: 1.927e-01; mom: 1.492e+00;
## best it: 232; best obj: 1.170e+00
## It: 271; obj: 1.177e+00; abs: 2.696e-03; rel: 2.286e-03; norm: 1.928e-01; mom: 1.590e+00;
## best it: 232; best obj: 1.170e+00
## It: 272; obj: 1.184e+00; abs: 7.319e-03; rel: 6.220e-03; norm: 1.925e-01; mom: 1.470e+00;
## best it: 232; best obj: 1.170e+00

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## It: 273; obj: 1.184e+00; abs: 4.102e-05; rel: 3.465e-05; norm: 1.929e-01; mom: 1.652e+00;
## best it: 232; best obj: 1.170e+00
## It: 274; obj: 1.181e+00; abs: 3.273e-03; rel: 2.764e-03; norm: 1.925e-01; mom: 1.560e+00;
## best it: 232; best obj: 1.170e+00
## It: 275; obj: 1.177e+00; abs: 3.695e-03; rel: 3.129e-03; norm: 1.928e-01; mom: 1.650e+00;
## best it: 232; best obj: 1.170e+00

## It: 276; obj: 1.181e+00; abs: 4.077e-03; rel: 3.464e-03; norm: 1.924e-01; mom: 1.689e+00;
## best it: 232; best obj: 1.170e+00
## It: 277; obj: 1.184e+00; abs: 2.449e-03; rel: 2.074e-03; norm: 1.930e-01; mom: 1.432e+00;
## best it: 232; best obj: 1.170e+00
## It: 278; obj: 1.181e+00; abs: 2.972e-03; rel: 2.511e-03; norm: 1.928e-01; mom: 1.966e+00;
## best it: 232; best obj: 1.170e+00
## It: 279; obj: 1.175e+00; abs: 5.449e-03; rel: 4.615e-03; norm: 1.925e-01; mom: 1.365e+00;
## best it: 232; best obj: 1.170e+00
## It: 280; obj: 1.178e+00; abs: 3.133e-03; rel: 2.667e-03; norm: 1.924e-01; mom: 1.619e+00;
## best it: 232; best obj: 1.170e+00
## It: 281; obj: 1.187e+00; abs: 9.025e-03; rel: 7.660e-03; norm: 1.926e-01; mom: 9.805e-01;
## best it: 232; best obj: 1.170e+00
## It: 282; obj: 1.180e+00; abs: 7.068e-03; rel: 5.954e-03; norm: 1.927e-01; mom: 1.777e+00;
## best it: 232; best obj: 1.170e+00
## It: 283; obj: 1.179e+00; abs: 1.537e-03; rel: 1.303e-03; norm: 1.931e-01; mom: 1.861e+00;
## best it: 232; best obj: 1.170e+00
## It: 284; obj: 1.179e+00; abs: 7.619e-04; rel: 6.464e-04; norm: 1.924e-01; mom: 1.624e+00;
## best it: 232; best obj: 1.170e+00
## It: 285; obj: 1.187e+00; abs: 7.487e-03; rel: 6.348e-03; norm: 1.929e-01; mom: 1.733e+00;
## best it: 232; best obj: 1.170e+00
## It: 286; obj: 1.183e+00; abs: 4.299e-03; rel: 3.622e-03; norm: 1.932e-01; mom: 1.792e+00;
## best it: 232; best obj: 1.170e+00
## It: 287; obj: 1.183e+00; abs: 4.434e-04; rel: 3.750e-04; norm: 1.929e-01; mom: 2.169e+00;
## best it: 232; best obj: 1.170e+00
## It: 288; obj: 1.186e+00; abs: 3.071e-03; rel: 2.596e-03; norm: 1.924e-01; mom: 1.651e+00;
## best it: 232; best obj: 1.170e+00
## It: 289; obj: 1.185e+00; abs: 7.003e-04; rel: 5.904e-04; norm: 1.926e-01; mom: 1.857e+00;
## best it: 232; best obj: 1.170e+00
## It: 290; obj: 1.183e+00; abs: 2.522e-03; rel: 2.128e-03; norm: 1.928e-01; mom: 1.734e+00;
## best it: 232; best obj: 1.170e+00
## It: 291; obj: 1.182e+00; abs: 1.320e-03; rel: 1.116e-03; norm: 1.928e-01; mom: 1.843e+00;
## best it: 232; best obj: 1.170e+00
## It: 292; obj: 1.184e+00; abs: 2.377e-03; rel: 2.011e-03; norm: 1.927e-01; mom: 1.682e+00;
## best it: 232; best obj: 1.170e+00
## It: 293; obj: 1.187e+00; abs: 2.724e-03; rel: 2.301e-03; norm: 1.923e-01; mom: 1.654e+00;
## best it: 232; best obj: 1.170e+00
## It: 294; obj: 1.184e+00; abs: 2.568e-03; rel: 2.164e-03; norm: 1.926e-01; mom: 1.618e+00;
## best it: 232; best obj: 1.170e+00
## It: 295; obj: 1.178e+00; abs: 5.932e-03; rel: 5.009e-03; norm: 1.925e-01; mom: 1.505e+00;
## best it: 232; best obj: 1.170e+00
## It: 296; obj: 1.180e+00; abs: 1.762e-03; rel: 1.495e-03; norm: 1.926e-01; mom: 1.742e+00;
## best it: 232; best obj: 1.170e+00
## It: 297; obj: 1.185e+00; abs: 5.526e-03; rel: 4.684e-03; norm: 1.926e-01; mom: 1.388e+00;
## best it: 232; best obj: 1.170e+00
## It: 298; obj: 1.187e+00; abs: 1.375e-03; rel: 1.159e-03; norm: 1.928e-01; mom: 1.658e+00;
## best it: 232; best obj: 1.170e+00
## It: 299; obj: 1.186e+00; abs: 7.755e-04; rel: 6.534e-04; norm: 1.926e-01; mom: 1.979e+00;

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## best it: 232; best obj: 1.170e+00
## It: 300; obj: 1.178e+00; abs: 7.767e-03; rel: 6.548e-03; norm: 1.927e-01; mom: 1.418e+00;
## best it: 232; best obj: 1.170e+00

## It: 301; obj: 1.178e+00; abs: 1.309e-05; rel: 1.111e-05; norm: 1.925e-01; mom: 1.792e+00;
## best it: 232; best obj: 1.170e+00
## It: 302; obj: 1.187e+00; abs: 8.917e-03; rel: 7.568e-03; norm: 1.925e-01; mom: 1.526e+00;
## best it: 232; best obj: 1.170e+00
## It: 303; obj: 1.187e+00; abs: 1.481e-04; rel: 1.247e-04; norm: 1.927e-01; mom: 1.776e+00;
## best it: 232; best obj: 1.170e+00
## It: 304; obj: 1.186e+00; abs: 1.428e-03; rel: 1.203e-03; norm: 1.926e-01; mom: 2.017e+00;
## best it: 232; best obj: 1.170e+00
## It: 305; obj: 1.182e+00; abs: 3.691e-03; rel: 3.113e-03; norm: 1.926e-01; mom: 1.732e+00;
## best it: 232; best obj: 1.170e+00
## It: 306; obj: 1.182e+00; abs: 3.738e-04; rel: 3.162e-04; norm: 1.925e-01; mom: 2.136e+00;
## best it: 232; best obj: 1.170e+00
## It: 307; obj: 1.182e+00; abs: 5.493e-04; rel: 4.649e-04; norm: 1.927e-01; mom: 1.239e+00;
## best it: 232; best obj: 1.170e+00
## It: 308; obj: 1.183e+00; abs: 6.124e-04; rel: 5.181e-04; norm: 1.928e-01; mom: 1.623e+00;
## best it: 232; best obj: 1.170e+00
## It: 309; obj: 1.187e+00; abs: 4.516e-03; rel: 3.818e-03; norm: 1.927e-01; mom: 1.693e+00;
## best it: 232; best obj: 1.170e+00
## It: 310; obj: 1.187e+00; abs: 5.365e-04; rel: 4.519e-04; norm: 1.927e-01; mom: 1.999e+00;
## best it: 232; best obj: 1.170e+00
## It: 311; obj: 1.182e+00; abs: 4.998e-03; rel: 4.211e-03; norm: 1.927e-01; mom: 1.704e+00;
## best it: 232; best obj: 1.170e+00
## It: 312; obj: 1.182e+00; abs: 7.381e-05; rel: 6.246e-05; norm: 1.926e-01; mom: 2.019e+00;
## best it: 232; best obj: 1.170e+00
## It: 313; obj: 1.183e+00; abs: 1.189e-03; rel: 1.007e-03; norm: 1.923e-01; mom: 1.690e+00;
## best it: 232; best obj: 1.170e+00
## It: 314; obj: 1.186e+00; abs: 3.151e-03; rel: 2.664e-03; norm: 1.924e-01; mom: 1.857e+00;
## best it: 232; best obj: 1.170e+00
## It: 315; obj: 1.184e+00; abs: 2.250e-03; rel: 1.898e-03; norm: 1.924e-01; mom: 1.662e+00;
## best it: 232; best obj: 1.170e+00
## It: 316; obj: 1.183e+00; abs: 7.502e-04; rel: 6.338e-04; norm: 1.925e-01; mom: 1.722e+00;
## best it: 232; best obj: 1.170e+00
## It: 317; obj: 1.187e+00; abs: 4.360e-03; rel: 3.686e-03; norm: 1.925e-01; mom: 1.528e+00;
## best it: 232; best obj: 1.170e+00
## It: 318; obj: 1.187e+00; abs: 6.577e-04; rel: 5.539e-04; norm: 1.921e-01; mom: 1.627e+00;
## best it: 232; best obj: 1.170e+00
## It: 319; obj: 1.187e+00; abs: 7.352e-04; rel: 6.195e-04; norm: 1.926e-01; mom: 1.748e+00;
## best it: 232; best obj: 1.170e+00
## It: 320; obj: 1.183e+00; abs: 4.576e-03; rel: 3.854e-03; norm: 1.922e-01; mom: 1.640e+00;
## best it: 232; best obj: 1.170e+00
## It: 321; obj: 1.186e+00; abs: 3.544e-03; rel: 2.996e-03; norm: 1.928e-01; mom: 1.759e+00;
## best it: 232; best obj: 1.170e+00
## It: 322; obj: 1.187e+00; abs: 8.219e-04; rel: 6.928e-04; norm: 1.927e-01; mom: 1.525e+00;
## best it: 232; best obj: 1.170e+00
## It: 323; obj: 1.187e+00; abs: 3.224e-05; rel: 2.715e-05; norm: 1.930e-01; mom: 2.170e+00;
## best it: 232; best obj: 1.170e+00
## It: 324; obj: 1.183e+00; abs: 4.646e-03; rel: 3.913e-03; norm: 1.924e-01; mom: 9.382e-01;
## best it: 232; best obj: 1.170e+00
## It: 325; obj: 1.184e+00; abs: 1.019e-03; rel: 8.619e-04; norm: 1.926e-01; mom: 2.260e+00;
## best it: 232; best obj: 1.170e+00

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## It: 326; obj: 1.184e+00; abs: 8.269e-04; rel: 6.987e-04; norm: 1.924e-01; mom: 8.381e-01;
## best it: 232; best obj: 1.170e+00
## It: 327; obj: 1.183e+00; abs: 1.899e-03; rel: 1.603e-03; norm: 1.929e-01; mom: 2.179e+00;
## best it: 232; best obj: 1.170e+00
## It: 328; obj: 1.185e+00; abs: 2.250e-03; rel: 1.903e-03; norm: 1.924e-01; mom: 9.181e-01;
## best it: 232; best obj: 1.170e+00
## It: 329; obj: 1.187e+00; abs: 2.081e-03; rel: 1.757e-03; norm: 1.925e-01; mom: 2.086e+00;
## best it: 232; best obj: 1.170e+00
## It: 330; obj: 1.190e+00; abs: 3.186e-03; rel: 2.684e-03; norm: 1.926e-01; mom: 1.317e+00;
## best it: 232; best obj: 1.170e+00
## It: 331; obj: 1.180e+00; abs: 9.596e-03; rel: 8.064e-03; norm: 1.926e-01; mom: 1.789e+00;
## best it: 232; best obj: 1.170e+00
## It: 332; obj: 1.180e+00; abs: 9.895e-05; rel: 8.382e-05; norm: 1.928e-01; mom: 1.745e+00;
## best it: 232; best obj: 1.170e+00
## It: 333; obj: 1.187e+00; abs: 6.223e-03; rel: 5.272e-03; norm: 1.926e-01; mom: 1.637e+00;
## best it: 232; best obj: 1.170e+00
## It: 334; obj: 1.193e+00; abs: 5.995e-03; rel: 5.052e-03; norm: 1.928e-01; mom: 2.146e+00;
## best it: 232; best obj: 1.170e+00
## It: 335; obj: 1.180e+00; abs: 1.208e-02; rel: 1.013e-02; norm: 1.924e-01; mom: 1.584e+00;
## best it: 232; best obj: 1.170e+00
## It: 336; obj: 1.175e+00; abs: 5.344e-03; rel: 4.527e-03; norm: 1.924e-01; mom: 2.167e+00;
## best it: 232; best obj: 1.170e+00
## It: 337; obj: 1.182e+00; abs: 7.212e-03; rel: 6.137e-03; norm: 1.923e-01; mom: 1.172e+00;
## best it: 232; best obj: 1.170e+00
## It: 338; obj: 1.191e+00; abs: 8.444e-03; rel: 7.142e-03; norm: 1.927e-01; mom: 1.560e+00;
## best it: 232; best obj: 1.170e+00
## It: 339; obj: 1.191e+00; abs: 2.664e-04; rel: 2.237e-04; norm: 1.928e-01; mom: 1.922e+00;
## best it: 232; best obj: 1.170e+00
## It: 340; obj: 1.179e+00; abs: 1.183e-02; rel: 9.933e-03; norm: 1.928e-01; mom: 1.864e+00;
## best it: 232; best obj: 1.170e+00
## It: 341; obj: 1.178e+00; abs: 1.033e-03; rel: 8.766e-04; norm: 1.924e-01; mom: 1.802e+00;
## best it: 232; best obj: 1.170e+00
## It: 342; obj: 1.191e+00; abs: 1.323e-02; rel: 1.123e-02; norm: 1.928e-01; mom: 1.375e+00;
## best it: 232; best obj: 1.170e+00
## It: 343; obj: 1.192e+00; abs: 1.475e-03; rel: 1.239e-03; norm: 1.929e-01; mom: 2.004e+00;
## best it: 232; best obj: 1.170e+00
## It: 344; obj: 1.183e+00; abs: 9.842e-03; rel: 8.254e-03; norm: 1.927e-01; mom: 1.781e+00;
## best it: 232; best obj: 1.170e+00
## It: 345; obj: 1.178e+00; abs: 4.619e-03; rel: 3.906e-03; norm: 1.925e-01; mom: 2.000e+00;
## best it: 232; best obj: 1.170e+00
## It: 346; obj: 1.185e+00; abs: 7.193e-03; rel: 6.106e-03; norm: 1.923e-01; mom: 1.434e+00;
## best it: 232; best obj: 1.170e+00
## It: 347; obj: 1.190e+00; abs: 4.519e-03; rel: 3.813e-03; norm: 1.932e-01; mom: 1.629e+00;
## best it: 232; best obj: 1.170e+00
## It: 348; obj: 1.185e+00; abs: 4.340e-03; rel: 3.649e-03; norm: 1.930e-01; mom: 1.440e+00;
## best it: 232; best obj: 1.170e+00
## It: 349; obj: 1.184e+00; abs: 9.849e-04; rel: 8.310e-04; norm: 1.927e-01; mom: 2.283e+00;
## best it: 232; best obj: 1.170e+00
## It: 350; obj: 1.185e+00; abs: 3.614e-04; rel: 3.052e-04; norm: 1.924e-01; mom: 1.087e+00;
## best it: 232; best obj: 1.170e+00

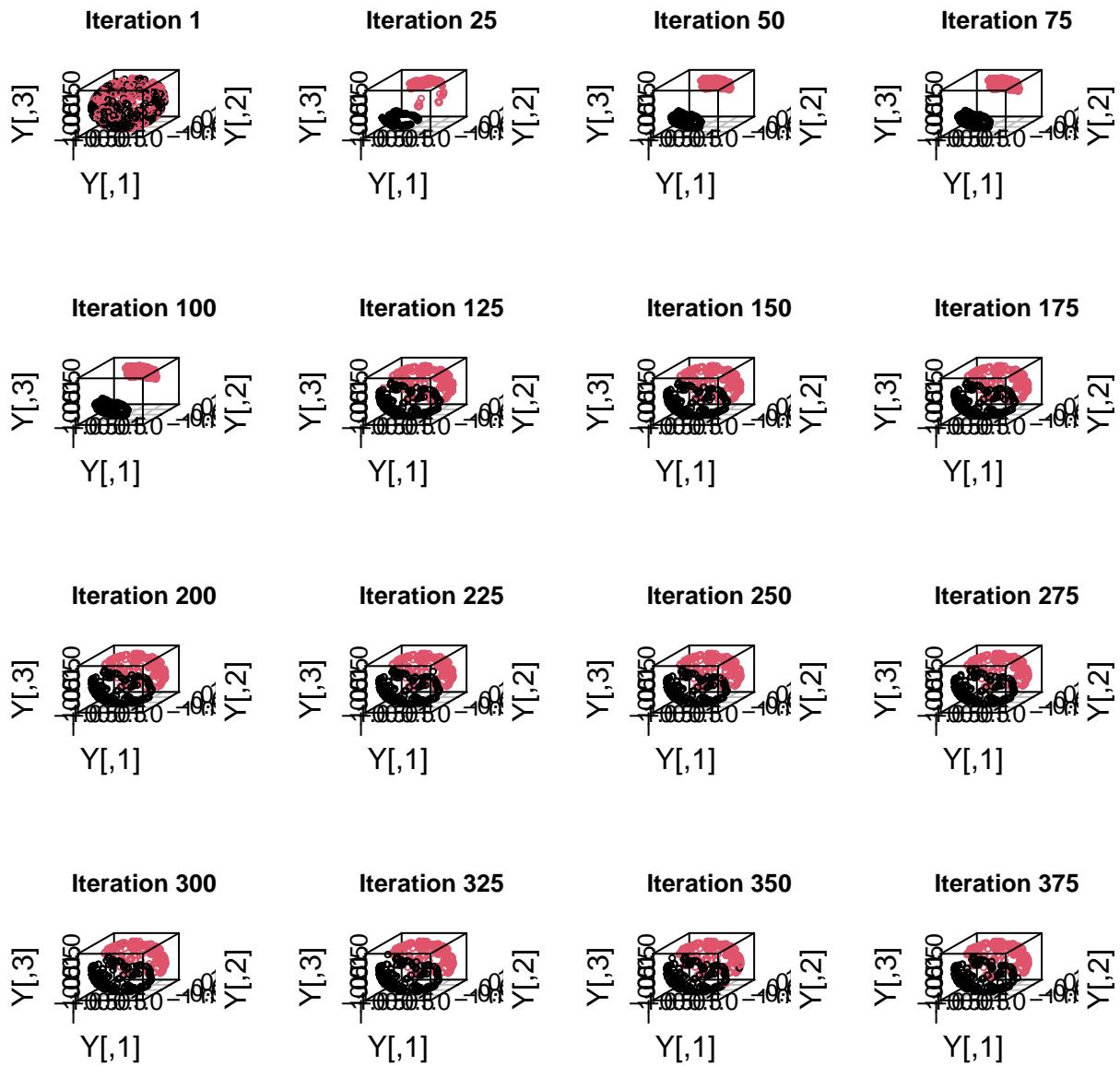
## It: 351; obj: 1.184e+00; abs: 7.808e-04; rel: 6.591e-04; norm: 1.929e-01; mom: 2.234e+00;
## best it: 232; best obj: 1.170e+00
## It: 352; obj: 1.179e+00; abs: 4.821e-03; rel: 4.072e-03; norm: 1.927e-01; mom: 1.158e+00;

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## best it: 232; best obj: 1.170e+00
## It: 353; obj: 1.180e+00; abs: 8.825e-04; rel: 7.484e-04; norm: 1.923e-01; mom: 1.742e+00;
## best it: 232; best obj: 1.170e+00
## It: 354; obj: 1.190e+00; abs: 9.825e-03; rel: 8.326e-03; norm: 1.922e-01; mom: 1.250e+00;
## best it: 232; best obj: 1.170e+00
## It: 355; obj: 1.188e+00; abs: 1.432e-03; rel: 1.204e-03; norm: 1.926e-01; mom: 2.018e+00;
## best it: 232; best obj: 1.170e+00
## It: 356; obj: 1.183e+00; abs: 5.073e-03; rel: 4.269e-03; norm: 1.928e-01; mom: 1.650e+00;
## best it: 232; best obj: 1.170e+00
## It: 357; obj: 1.182e+00; abs: 8.707e-04; rel: 7.359e-04; norm: 1.924e-01; mom: 1.797e+00;
## best it: 232; best obj: 1.170e+00
## It: 358; obj: 1.186e+00; abs: 3.487e-03; rel: 2.949e-03; norm: 1.925e-01; mom: 1.646e+00;
## best it: 232; best obj: 1.170e+00
## It: 359; obj: 1.185e+00; abs: 5.990e-04; rel: 5.051e-04; norm: 1.931e-01; mom: 2.032e+00;
## best it: 232; best obj: 1.170e+00
## It: 360; obj: 1.185e+00; abs: 6.166e-04; rel: 5.202e-04; norm: 1.927e-01; mom: 1.308e+00;
## best it: 232; best obj: 1.170e+00
## It: 361; obj: 1.187e+00; abs: 1.929e-03; rel: 1.628e-03; norm: 1.925e-01; mom: 2.140e+00;
## best it: 232; best obj: 1.170e+00
## It: 362; obj: 1.187e+00; abs: 5.044e-04; rel: 4.251e-04; norm: 1.924e-01; mom: 1.540e+00;
## best it: 232; best obj: 1.170e+00
## It: 363; obj: 1.180e+00; abs: 6.739e-03; rel: 5.677e-03; norm: 1.931e-01; mom: 2.304e+00;
## best it: 232; best obj: 1.170e+00
## It: 364; obj: 1.182e+00; abs: 1.290e-03; rel: 1.093e-03; norm: 1.925e-01; mom: 1.356e+00;
## best it: 232; best obj: 1.170e+00
## It: 365; obj: 1.189e+00; abs: 7.592e-03; rel: 6.425e-03; norm: 1.924e-01; mom: 1.935e+00;
## best it: 232; best obj: 1.170e+00
## It: 366; obj: 1.191e+00; abs: 2.103e-03; rel: 1.769e-03; norm: 1.927e-01; mom: 1.670e+00;
## best it: 232; best obj: 1.170e+00
## It: 367; obj: 1.181e+00; abs: 1.055e-02; rel: 8.852e-03; norm: 1.927e-01; mom: 1.816e+00;
## best it: 232; best obj: 1.170e+00
## It: 368; obj: 1.179e+00; abs: 1.376e-03; rel: 1.165e-03; norm: 1.928e-01; mom: 1.712e+00;
## best it: 232; best obj: 1.170e+00
## It: 369; obj: 1.187e+00; abs: 7.708e-03; rel: 6.536e-03; norm: 1.922e-01; mom: 1.689e+00;
## best it: 232; best obj: 1.170e+00
## It: 370; obj: 1.190e+00; abs: 2.763e-03; rel: 2.327e-03; norm: 1.928e-01; mom: 1.551e+00;
## best it: 232; best obj: 1.170e+00
## It: 371; obj: 1.183e+00; abs: 7.369e-03; rel: 6.193e-03; norm: 1.926e-01; mom: 1.698e+00;
## best it: 232; best obj: 1.170e+00
## It: 372; obj: 1.179e+00; abs: 3.715e-03; rel: 3.141e-03; norm: 1.924e-01; mom: 1.727e+00;
## best it: 232; best obj: 1.170e+00
## It: 373; obj: 1.186e+00; abs: 7.564e-03; rel: 6.417e-03; norm: 1.924e-01; mom: 1.769e+00;
## best it: 232; best obj: 1.170e+00
## It: 374; obj: 1.193e+00; abs: 6.810e-03; rel: 5.740e-03; norm: 1.927e-01; mom: 1.507e+00;
## best it: 232; best obj: 1.170e+00
## It: 375; obj: 1.184e+00; abs: 9.124e-03; rel: 7.647e-03; norm: 1.927e-01; mom: 2.250e+00;
## best it: 232; best obj: 1.170e+00

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## It: 376; obj: 1.177e+00; abs: 6.905e-03; rel: 5.832e-03; norm: 1.926e-01; mom: 1.563e+00;
## best it: 232; best obj: 1.170e+00
## It: 377; obj: 1.183e+00; abs: 5.932e-03; rel: 5.040e-03; norm: 1.923e-01; mom: 1.900e+00;
## best it: 232; best obj: 1.170e+00
## It: 378; obj: 1.190e+00; abs: 7.383e-03; rel: 6.241e-03; norm: 1.926e-01; mom: 1.611e+00;
## best it: 232; best obj: 1.170e+00
## It: 379; obj: 1.184e+00; abs: 6.493e-03; rel: 5.454e-03; norm: 1.925e-01; mom: 2.380e+00;
## best it: 232; best obj: 1.170e+00
## It: 380; obj: 1.180e+00; abs: 3.550e-03; rel: 2.998e-03; norm: 1.926e-01; mom: 1.587e+00;
## best it: 232; best obj: 1.170e+00
## It: 381; obj: 1.184e+00; abs: 3.561e-03; rel: 3.017e-03; norm: 1.923e-01; mom: 2.248e+00;
## best it: 232; best obj: 1.170e+00
## It: 382; obj: 1.189e+00; abs: 4.609e-03; rel: 3.893e-03; norm: 1.924e-01; mom: 1.701e+00;
## best it: 232; best obj: 1.170e+00
## It: 383; obj: 1.184e+00; abs: 4.687e-03; rel: 3.943e-03; norm: 1.925e-01; mom: 2.283e+00;
## best it: 232; best obj: 1.170e+00
## It: 384; obj: 1.181e+00; abs: 2.871e-03; rel: 2.425e-03; norm: 1.927e-01; mom: 1.691e+00;

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## best it: 232; best obj: 1.170e+00
## It: 385; obj: 1.184e+00; abs: 3.062e-03; rel: 2.592e-03; norm: 1.923e-01; mom: 2.187e+00;
## best it: 232; best obj: 1.170e+00
## It: 386; obj: 1.191e+00; abs: 6.955e-03; rel: 5.873e-03; norm: 1.926e-01; mom: 1.562e+00;
## best it: 232; best obj: 1.170e+00
## It: 387; obj: 1.184e+00; abs: 6.589e-03; rel: 5.532e-03; norm: 1.928e-01; mom: 2.101e+00;
## best it: 232; best obj: 1.170e+00
## It: 388; obj: 1.178e+00; abs: 6.588e-03; rel: 5.562e-03; norm: 1.926e-01; mom: 1.853e+00;
## best it: 232; best obj: 1.170e+00
## It: 389; obj: 1.179e+00; abs: 9.756e-04; rel: 8.282e-04; norm: 1.923e-01; mom: 2.013e+00;
## best it: 232; best obj: 1.170e+00
## It: 390; obj: 1.187e+00; abs: 7.692e-03; rel: 6.525e-03; norm: 1.926e-01; mom: 1.583e+00;
## best it: 232; best obj: 1.170e+00
## It: 391; obj: 1.188e+00; abs: 1.439e-03; rel: 1.213e-03; norm: 1.929e-01; mom: 2.054e+00;
## best it: 232; best obj: 1.170e+00
## It: 392; obj: 1.183e+00; abs: 4.725e-03; rel: 3.978e-03; norm: 1.923e-01; mom: 1.621e+00;
## best it: 232; best obj: 1.170e+00
## It: 393; obj: 1.182e+00; abs: 1.264e-03; rel: 1.068e-03; norm: 1.925e-01; mom: 2.057e+00;
## best it: 232; best obj: 1.170e+00
## It: 394; obj: 1.183e+00; abs: 1.024e-03; rel: 8.664e-04; norm: 1.924e-01; mom: 1.843e+00;
## best it: 232; best obj: 1.170e+00
## It: 395; obj: 1.183e+00; abs: 2.058e-04; rel: 1.739e-04; norm: 1.930e-01; mom: 1.969e+00;
## best it: 232; best obj: 1.170e+00
## It: 396; obj: 1.181e+00; abs: 1.838e-03; rel: 1.554e-03; norm: 1.927e-01; mom: 1.316e+00;
## best it: 232; best obj: 1.170e+00
## It: 397; obj: 1.182e+00; abs: 1.140e-03; rel: 9.650e-04; norm: 1.924e-01; mom: 1.944e+00;
## best it: 232; best obj: 1.170e+00
## It: 398; obj: 1.184e+00; abs: 2.210e-03; rel: 1.869e-03; norm: 1.924e-01; mom: 1.415e+00;
## best it: 232; best obj: 1.170e+00
## It: 399; obj: 1.181e+00; abs: 3.267e-03; rel: 2.758e-03; norm: 1.928e-01; mom: 1.876e+00;
## best it: 232; best obj: 1.170e+00
## It: 400; obj: 1.183e+00; abs: 2.303e-03; rel: 1.950e-03; norm: 1.927e-01; mom: 1.009e+00;
## best it: 232; best obj: 1.170e+00

## It: 401; obj: 1.187e+00; abs: 3.390e-03; rel: 2.865e-03; norm: 1.924e-01; mom: 1.942e+00;
## best it: 232; best obj: 1.170e+00
## It: 402; obj: 1.189e+00; abs: 2.111e-03; rel: 1.779e-03; norm: 1.927e-01; mom: 8.090e-01;
## best it: 232; best obj: 1.170e+00
## It: 403; obj: 1.183e+00; abs: 5.986e-03; rel: 5.035e-03; norm: 1.928e-01; mom: 2.252e+00;
## best it: 232; best obj: 1.170e+00
## It: 404; obj: 1.180e+00; abs: 2.919e-03; rel: 2.467e-03; norm: 1.929e-01; mom: 1.282e+00;
## best it: 232; best obj: 1.170e+00
## It: 405; obj: 1.181e+00; abs: 1.135e-03; rel: 9.616e-04; norm: 1.923e-01; mom: 1.818e+00;
## best it: 232; best obj: 1.170e+00
## It: 406; obj: 1.184e+00; abs: 3.198e-03; rel: 2.707e-03; norm: 1.926e-01; mom: 1.172e+00;
## best it: 232; best obj: 1.170e+00
## It: 407; obj: 1.187e+00; abs: 2.254e-03; rel: 1.903e-03; norm: 1.923e-01; mom: 2.058e+00;
## best it: 232; best obj: 1.170e+00
## It: 408; obj: 1.187e+00; abs: 1.622e-04; rel: 1.367e-04; norm: 1.931e-01; mom: 1.252e+00;
## best it: 232; best obj: 1.170e+00
## It: 409; obj: 1.183e+00; abs: 3.491e-03; rel: 2.941e-03; norm: 1.923e-01; mom: 2.285e+00;
## best it: 232; best obj: 1.170e+00
## It: 410; obj: 1.183e+00; abs: 1.869e-04; rel: 1.580e-04; norm: 1.925e-01; mom: 9.296e-01;
## best it: 232; best obj: 1.170e+00

```

```

## It: 411; obj: 1.185e+00; abs: 1.836e-03; rel: 1.551e-03; norm: 1.924e-01; mom: 2.177e+00;
## best it: 232; best obj: 1.170e+00
## It: 412; obj: 1.187e+00; abs: 1.664e-03; rel: 1.404e-03; norm: 1.930e-01; mom: 8.302e-01;
## best it: 232; best obj: 1.170e+00
## It: 413; obj: 1.184e+00; abs: 3.100e-03; rel: 2.612e-03; norm: 1.924e-01; mom: 2.402e+00;
## best it: 232; best obj: 1.170e+00
## It: 414; obj: 1.186e+00; abs: 1.801e-03; rel: 1.521e-03; norm: 1.928e-01; mom: 1.037e+00;
## best it: 232; best obj: 1.170e+00
## It: 415; obj: 1.184e+00; abs: 1.838e-03; rel: 1.550e-03; norm: 1.925e-01; mom: 2.154e+00;
## best it: 232; best obj: 1.170e+00
## It: 416; obj: 1.187e+00; abs: 2.907e-03; rel: 2.456e-03; norm: 1.927e-01; mom: 1.097e+00;
## best it: 232; best obj: 1.170e+00
## It: 417; obj: 1.184e+00; abs: 2.759e-03; rel: 2.325e-03; norm: 1.929e-01; mom: 2.276e+00;
## best it: 232; best obj: 1.170e+00
## It: 418; obj: 1.186e+00; abs: 2.553e-03; rel: 2.157e-03; norm: 1.927e-01; mom: 1.531e+00;
## best it: 232; best obj: 1.170e+00
## It: 419; obj: 1.182e+00; abs: 4.944e-03; rel: 4.167e-03; norm: 1.931e-01; mom: 1.905e+00;
## best it: 232; best obj: 1.170e+00
## It: 420; obj: 1.185e+00; abs: 3.651e-03; rel: 3.090e-03; norm: 1.925e-01; mom: 1.818e+00;
## best it: 232; best obj: 1.170e+00
## It: 421; obj: 1.182e+00; abs: 2.952e-03; rel: 2.491e-03; norm: 1.931e-01; mom: 1.712e+00;
## best it: 232; best obj: 1.170e+00
## It: 422; obj: 1.183e+00; abs: 4.235e-04; rel: 3.582e-04; norm: 1.924e-01; mom: 1.725e+00;
## best it: 232; best obj: 1.170e+00
## It: 423; obj: 1.183e+00; abs: 6.537e-05; rel: 5.528e-05; norm: 1.929e-01; mom: 1.704e+00;
## best it: 232; best obj: 1.170e+00
## It: 424; obj: 1.183e+00; abs: 8.326e-04; rel: 7.041e-04; norm: 1.925e-01; mom: 1.686e+00;
## best it: 232; best obj: 1.170e+00
## It: 425; obj: 1.187e+00; abs: 3.610e-03; rel: 3.051e-03; norm: 1.928e-01; mom: 1.455e+00;
## best it: 232; best obj: 1.170e+00

## It: 426; obj: 1.184e+00; abs: 2.618e-03; rel: 2.205e-03; norm: 1.924e-01; mom: 1.618e+00;
## best it: 232; best obj: 1.170e+00
## It: 427; obj: 1.182e+00; abs: 2.434e-03; rel: 2.055e-03; norm: 1.927e-01; mom: 1.915e+00;
## best it: 232; best obj: 1.170e+00
## It: 428; obj: 1.183e+00; abs: 1.050e-03; rel: 8.884e-04; norm: 1.928e-01; mom: 1.446e+00;
## best it: 232; best obj: 1.170e+00
## It: 429; obj: 1.185e+00; abs: 2.460e-03; rel: 2.080e-03; norm: 1.930e-01; mom: 1.623e+00;
## best it: 232; best obj: 1.170e+00
## It: 430; obj: 1.185e+00; abs: 1.607e-04; rel: 1.356e-04; norm: 1.924e-01; mom: 1.573e+00;
## best it: 232; best obj: 1.170e+00
## It: 431; obj: 1.181e+00; abs: 3.886e-03; rel: 3.279e-03; norm: 1.925e-01; mom: 1.904e+00;
## best it: 232; best obj: 1.170e+00
## It: 432; obj: 1.176e+00; abs: 5.935e-03; rel: 5.024e-03; norm: 1.928e-01; mom: 1.877e+00;
## best it: 232; best obj: 1.170e+00
## It: 433; obj: 1.178e+00; abs: 2.311e-03; rel: 1.966e-03; norm: 1.927e-01; mom: 1.856e+00;
## best it: 232; best obj: 1.170e+00
## It: 434; obj: 1.184e+00; abs: 5.965e-03; rel: 5.065e-03; norm: 1.926e-01; mom: 1.233e+00;
## best it: 232; best obj: 1.170e+00
## It: 435; obj: 1.188e+00; abs: 4.435e-03; rel: 3.746e-03; norm: 1.924e-01; mom: 1.985e+00;
## best it: 232; best obj: 1.170e+00
## It: 436; obj: 1.186e+00; abs: 2.052e-03; rel: 1.727e-03; norm: 1.929e-01; mom: 1.174e+00;
## best it: 232; best obj: 1.170e+00
## It: 437; obj: 1.180e+00; abs: 6.304e-03; rel: 5.315e-03; norm: 1.926e-01; mom: 2.102e+00;

```

```

## best it: 232; best obj: 1.170e+00
## It: 438; obj: 1.182e+00; abs: 2.273e-03; rel: 1.927e-03; norm: 1.926e-01; mom: 1.583e+00;
## best it: 232; best obj: 1.170e+00
## It: 439; obj: 1.186e+00; abs: 4.112e-03; rel: 3.479e-03; norm: 1.924e-01; mom: 1.474e+00;
## best it: 232; best obj: 1.170e+00
## It: 440; obj: 1.189e+00; abs: 2.728e-03; rel: 2.300e-03; norm: 1.930e-01; mom: 1.853e+00;
## best it: 232; best obj: 1.170e+00
## It: 441; obj: 1.182e+00; abs: 6.894e-03; rel: 5.798e-03; norm: 1.927e-01; mom: 1.914e+00;
## best it: 232; best obj: 1.170e+00
## It: 442; obj: 1.181e+00; abs: 8.906e-04; rel: 7.534e-04; norm: 1.926e-01; mom: 1.928e+00;
## best it: 232; best obj: 1.170e+00
## It: 443; obj: 1.184e+00; abs: 2.448e-03; rel: 2.072e-03; norm: 1.926e-01; mom: 1.311e+00;
## best it: 232; best obj: 1.170e+00
## It: 444; obj: 1.187e+00; abs: 2.932e-03; rel: 2.477e-03; norm: 1.929e-01; mom: 1.639e+00;
## best it: 232; best obj: 1.170e+00
## It: 445; obj: 1.185e+00; abs: 1.316e-03; rel: 1.109e-03; norm: 1.929e-01; mom: 1.879e+00;
## best it: 232; best obj: 1.170e+00
## It: 446; obj: 1.183e+00; abs: 2.449e-03; rel: 2.067e-03; norm: 1.928e-01; mom: 1.498e+00;
## best it: 232; best obj: 1.170e+00
## It: 447; obj: 1.183e+00; abs: 8.369e-05; rel: 7.076e-05; norm: 1.925e-01; mom: 1.815e+00;
## best it: 232; best obj: 1.170e+00
## It: 448; obj: 1.185e+00; abs: 2.678e-03; rel: 2.264e-03; norm: 1.926e-01; mom: 1.409e+00;
## best it: 232; best obj: 1.170e+00
## It: 449; obj: 1.186e+00; abs: 3.396e-04; rel: 2.865e-04; norm: 1.928e-01; mom: 1.785e+00;
## best it: 232; best obj: 1.170e+00
## It: 450; obj: 1.187e+00; abs: 1.132e-03; rel: 9.550e-04; norm: 1.929e-01; mom: 1.684e+00;
## best it: 232; best obj: 1.170e+00

## It: 451; obj: 1.183e+00; abs: 3.854e-03; rel: 3.247e-03; norm: 1.927e-01; mom: 1.751e+00;
## best it: 232; best obj: 1.170e+00
## It: 452; obj: 1.185e+00; abs: 1.761e-03; rel: 1.489e-03; norm: 1.927e-01; mom: 2.017e+00;
## best it: 232; best obj: 1.170e+00
## It: 453; obj: 1.185e+00; abs: 3.203e-04; rel: 2.704e-04; norm: 1.930e-01; mom: 1.817e+00;
## best it: 232; best obj: 1.170e+00
## It: 454; obj: 1.184e+00; abs: 1.056e-03; rel: 8.908e-04; norm: 1.928e-01; mom: 1.824e+00;
## best it: 232; best obj: 1.170e+00
## It: 455; obj: 1.182e+00; abs: 1.700e-03; rel: 1.436e-03; norm: 1.924e-01; mom: 1.793e+00;
## best it: 232; best obj: 1.170e+00
## It: 456; obj: 1.181e+00; abs: 8.980e-04; rel: 7.595e-04; norm: 1.926e-01; mom: 1.659e+00;
## best it: 232; best obj: 1.170e+00
## It: 457; obj: 1.181e+00; abs: 3.122e-04; rel: 2.642e-04; norm: 1.927e-01; mom: 1.418e+00;
## best it: 232; best obj: 1.170e+00
## It: 458; obj: 1.182e+00; abs: 1.040e-03; rel: 8.805e-04; norm: 1.927e-01; mom: 1.353e+00;
## best it: 232; best obj: 1.170e+00
## It: 459; obj: 1.185e+00; abs: 2.571e-03; rel: 2.175e-03; norm: 1.921e-01; mom: 1.609e+00;
## best it: 232; best obj: 1.170e+00
## It: 460; obj: 1.188e+00; abs: 3.317e-03; rel: 2.800e-03; norm: 1.925e-01; mom: 1.539e+00;
## best it: 232; best obj: 1.170e+00
## It: 461; obj: 1.182e+00; abs: 5.893e-03; rel: 4.961e-03; norm: 1.926e-01; mom: 1.741e+00;
## best it: 232; best obj: 1.170e+00
## It: 462; obj: 1.181e+00; abs: 1.625e-03; rel: 1.375e-03; norm: 1.927e-01; mom: 1.427e+00;
## best it: 232; best obj: 1.170e+00
## It: 463; obj: 1.184e+00; abs: 3.940e-03; rel: 3.337e-03; norm: 1.922e-01; mom: 1.681e+00;
## best it: 232; best obj: 1.170e+00

```

```

## It: 464; obj: 1.190e+00; abs: 5.593e-03; rel: 4.722e-03; norm: 1.927e-01; mom: 1.456e+00;
## best it: 232; best obj: 1.170e+00
## It: 465; obj: 1.185e+00; abs: 5.429e-03; rel: 4.562e-03; norm: 1.930e-01; mom: 2.070e+00;
## best it: 232; best obj: 1.170e+00
## It: 466; obj: 1.180e+00; abs: 4.816e-03; rel: 4.065e-03; norm: 1.929e-01; mom: 1.489e+00;
## best it: 232; best obj: 1.170e+00
## It: 467; obj: 1.182e+00; abs: 2.134e-03; rel: 1.809e-03; norm: 1.921e-01; mom: 1.771e+00;
## best it: 232; best obj: 1.170e+00
## It: 468; obj: 1.187e+00; abs: 4.998e-03; rel: 4.228e-03; norm: 1.925e-01; mom: 1.511e+00;
## best it: 232; best obj: 1.170e+00
## It: 469; obj: 1.188e+00; abs: 8.303e-04; rel: 6.995e-04; norm: 1.930e-01; mom: 1.759e+00;
## best it: 232; best obj: 1.170e+00
## It: 470; obj: 1.181e+00; abs: 6.553e-03; rel: 5.517e-03; norm: 1.928e-01; mom: 1.602e+00;
## best it: 232; best obj: 1.170e+00
## It: 471; obj: 1.181e+00; abs: 6.502e-04; rel: 5.505e-04; norm: 1.924e-01; mom: 2.114e+00;
## best it: 232; best obj: 1.170e+00
## It: 472; obj: 1.185e+00; abs: 4.211e-03; rel: 3.567e-03; norm: 1.925e-01; mom: 1.652e+00;
## best it: 232; best obj: 1.170e+00
## It: 473; obj: 1.185e+00; abs: 6.358e-04; rel: 5.367e-04; norm: 1.931e-01; mom: 1.920e+00;
## best it: 232; best obj: 1.170e+00
## It: 474; obj: 1.184e+00; abs: 1.882e-03; rel: 1.587e-03; norm: 1.927e-01; mom: 1.653e+00;
## best it: 232; best obj: 1.170e+00
## It: 475; obj: 1.185e+00; abs: 9.748e-04; rel: 8.236e-04; norm: 1.923e-01; mom: 2.228e+00;
## best it: 232; best obj: 1.170e+00

## It: 476; obj: 1.184e+00; abs: 1.631e-04; rel: 1.377e-04; norm: 1.927e-01; mom: 1.693e+00;
## best it: 232; best obj: 1.170e+00
## It: 477; obj: 1.183e+00; abs: 1.815e-03; rel: 1.533e-03; norm: 1.928e-01; mom: 2.018e+00;
## best it: 232; best obj: 1.170e+00
## It: 478; obj: 1.180e+00; abs: 2.270e-03; rel: 1.919e-03; norm: 1.926e-01; mom: 1.484e+00;
## best it: 232; best obj: 1.170e+00
## It: 479; obj: 1.184e+00; abs: 3.223e-03; rel: 2.731e-03; norm: 1.920e-01; mom: 1.556e+00;
## best it: 232; best obj: 1.170e+00
## It: 480; obj: 1.189e+00; abs: 5.556e-03; rel: 4.695e-03; norm: 1.926e-01; mom: 1.647e+00;
## best it: 232; best obj: 1.170e+00
## It: 481; obj: 1.183e+00; abs: 5.901e-03; rel: 4.963e-03; norm: 1.927e-01; mom: 1.715e+00;
## best it: 232; best obj: 1.170e+00
## It: 482; obj: 1.179e+00; abs: 3.873e-03; rel: 3.274e-03; norm: 1.927e-01; mom: 1.397e+00;
## best it: 232; best obj: 1.170e+00
## It: 483; obj: 1.185e+00; abs: 5.885e-03; rel: 4.990e-03; norm: 1.924e-01; mom: 1.422e+00;
## best it: 232; best obj: 1.170e+00
## It: 484; obj: 1.190e+00; abs: 4.567e-03; rel: 3.853e-03; norm: 1.926e-01; mom: 1.667e+00;
## best it: 232; best obj: 1.170e+00
## It: 485; obj: 1.186e+00; abs: 3.842e-03; rel: 3.230e-03; norm: 1.929e-01; mom: 1.829e+00;
## best it: 232; best obj: 1.170e+00
## It: 486; obj: 1.180e+00; abs: 5.450e-03; rel: 4.596e-03; norm: 1.926e-01; mom: 1.446e+00;
## best it: 232; best obj: 1.170e+00
## It: 487; obj: 1.184e+00; abs: 3.658e-03; rel: 3.099e-03; norm: 1.927e-01; mom: 1.766e+00;
## best it: 232; best obj: 1.170e+00
## It: 488; obj: 1.189e+00; abs: 4.878e-03; rel: 4.120e-03; norm: 1.927e-01; mom: 1.636e+00;
## best it: 232; best obj: 1.170e+00
## It: 489; obj: 1.186e+00; abs: 2.709e-03; rel: 2.278e-03; norm: 1.930e-01; mom: 1.591e+00;
## best it: 232; best obj: 1.170e+00
## It: 490; obj: 1.182e+00; abs: 4.769e-03; rel: 4.020e-03; norm: 1.927e-01; mom: 1.791e+00;

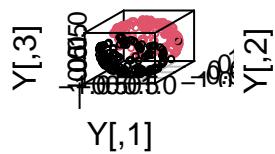
```

```

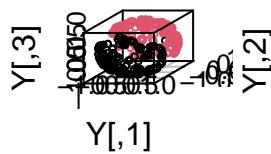
## best it: 232; best obj: 1.170e+00
## It: 491; obj: 1.181e+00; abs: 3.160e-04; rel: 2.675e-04; norm: 1.926e-01; mom: 1.637e+00;
## best it: 232; best obj: 1.170e+00
## It: 492; obj: 1.180e+00; abs: 1.138e-03; rel: 9.638e-04; norm: 1.924e-01; mom: 1.912e+00;
## best it: 232; best obj: 1.170e+00
## It: 493; obj: 1.184e+00; abs: 3.882e-03; rel: 3.290e-03; norm: 1.928e-01; mom: 1.375e+00;
## best it: 232; best obj: 1.170e+00
## It: 494; obj: 1.185e+00; abs: 1.386e-03; rel: 1.171e-03; norm: 1.924e-01; mom: 1.608e+00;
## best it: 232; best obj: 1.170e+00
## It: 495; obj: 1.186e+00; abs: 1.041e-03; rel: 8.782e-04; norm: 1.930e-01; mom: 1.844e+00;
## best it: 232; best obj: 1.170e+00
## It: 496; obj: 1.187e+00; abs: 9.651e-04; rel: 8.135e-04; norm: 1.925e-01; mom: 1.478e+00;
## best it: 232; best obj: 1.170e+00
## It: 497; obj: 1.182e+00; abs: 5.722e-03; rel: 4.820e-03; norm: 1.926e-01; mom: 2.004e+00;
## best it: 232; best obj: 1.170e+00
## It: 498; obj: 1.180e+00; abs: 1.440e-03; rel: 1.219e-03; norm: 1.926e-01; mom: 1.390e+00;
## best it: 232; best obj: 1.170e+00
## It: 499; obj: 1.179e+00; abs: 1.147e-03; rel: 9.720e-04; norm: 1.927e-01; mom: 2.021e+00;
## best it: 232; best obj: 1.170e+00
## It: 500; obj: 1.185e+00; abs: 5.646e-03; rel: 4.789e-03; norm: 1.931e-01; mom: 1.171e+00;
## best it: 232; best obj: 1.170e+00

```

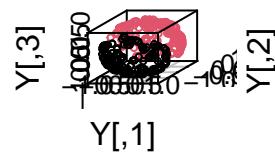
**Iteration 400**



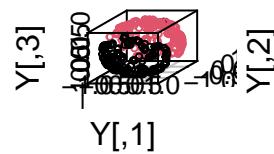
**Iteration 425**



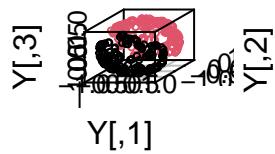
**Iteration 450**



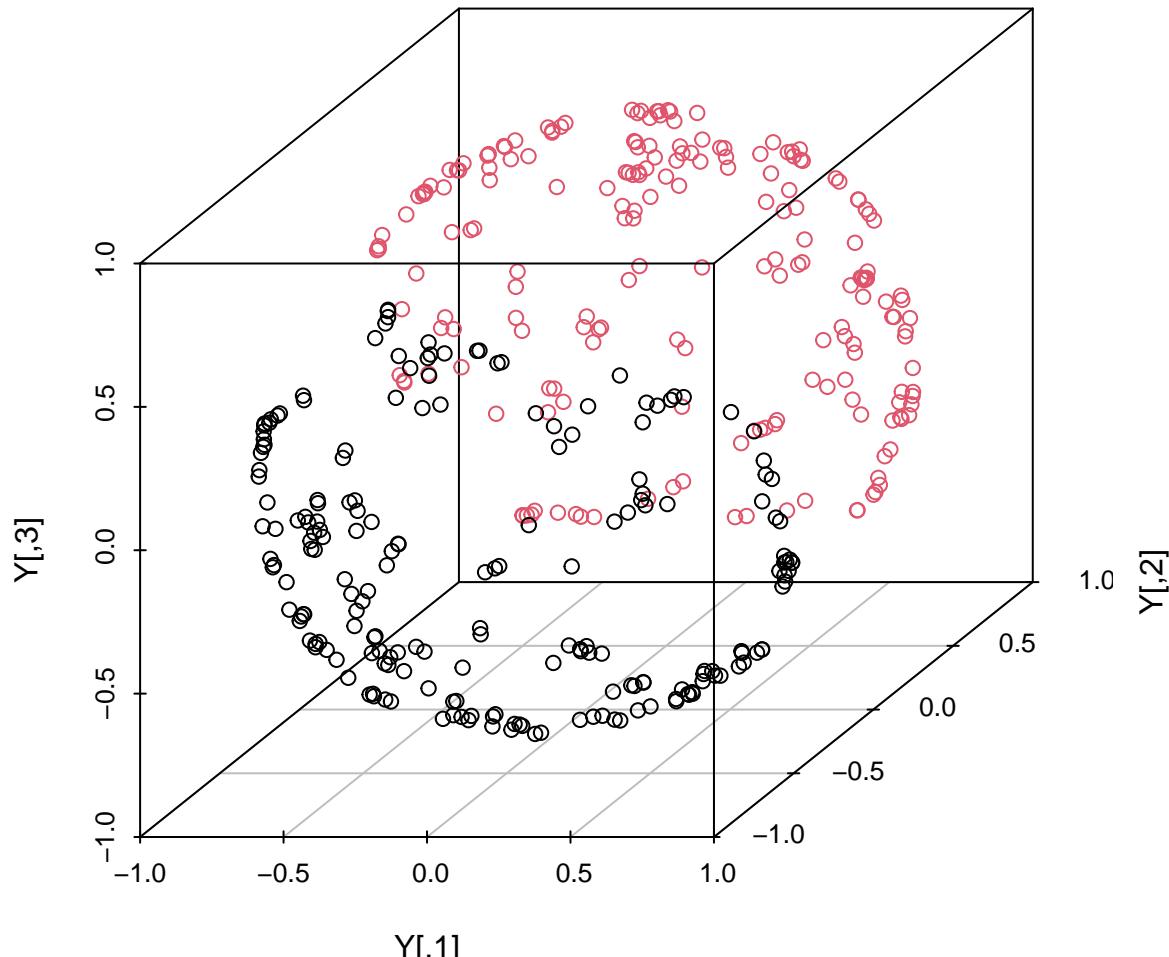
**Iteration 475**



**Iteration 500**

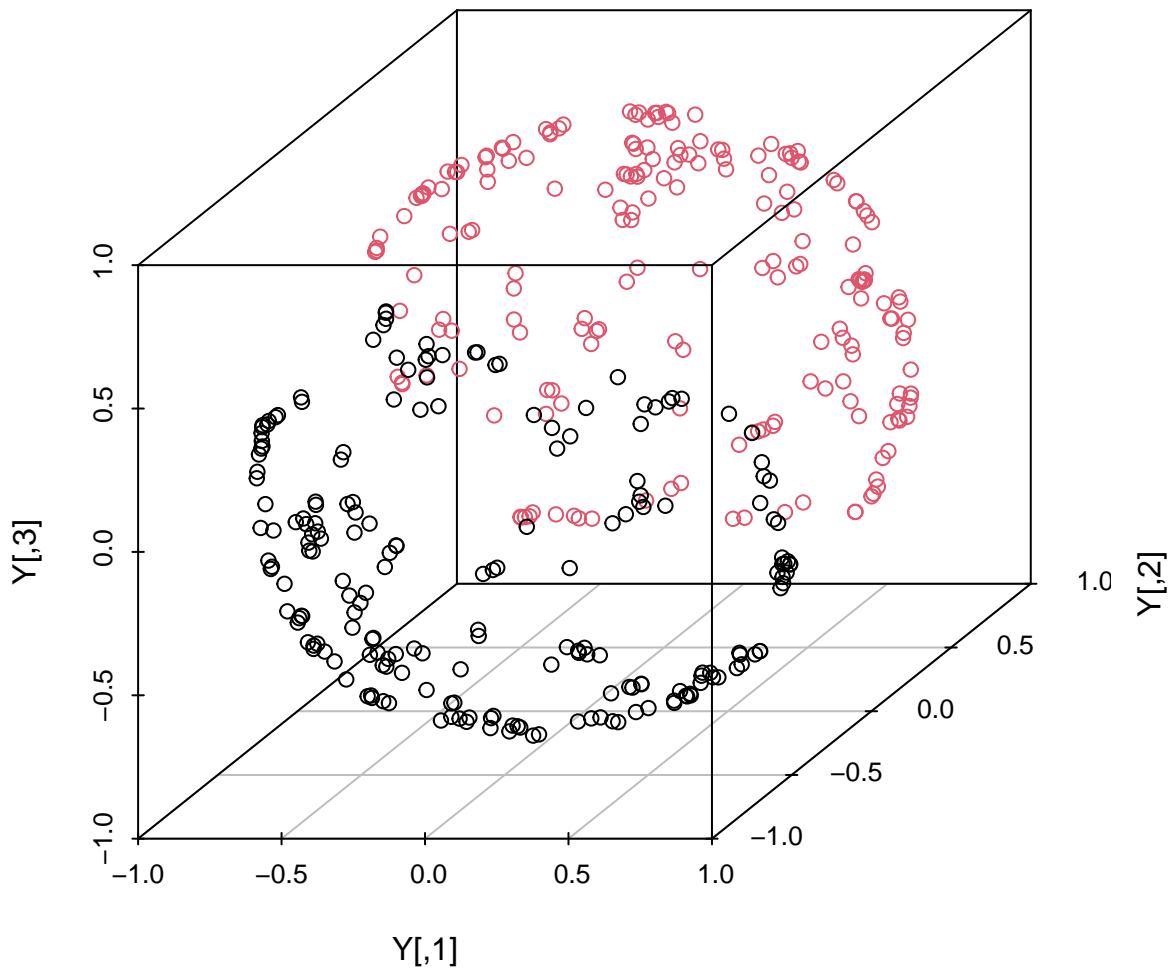


## Iteration 232



```
Y <- res_pscsne$best_Y
```

```
scatterplot3d::scatterplot3d(Y, xlim = c(-1, 1), ylim = c(-1, 1),
                             zlim = c(-1, 1), color = colors)
```



It's clearly clustered the two groups we had in the original generated data.

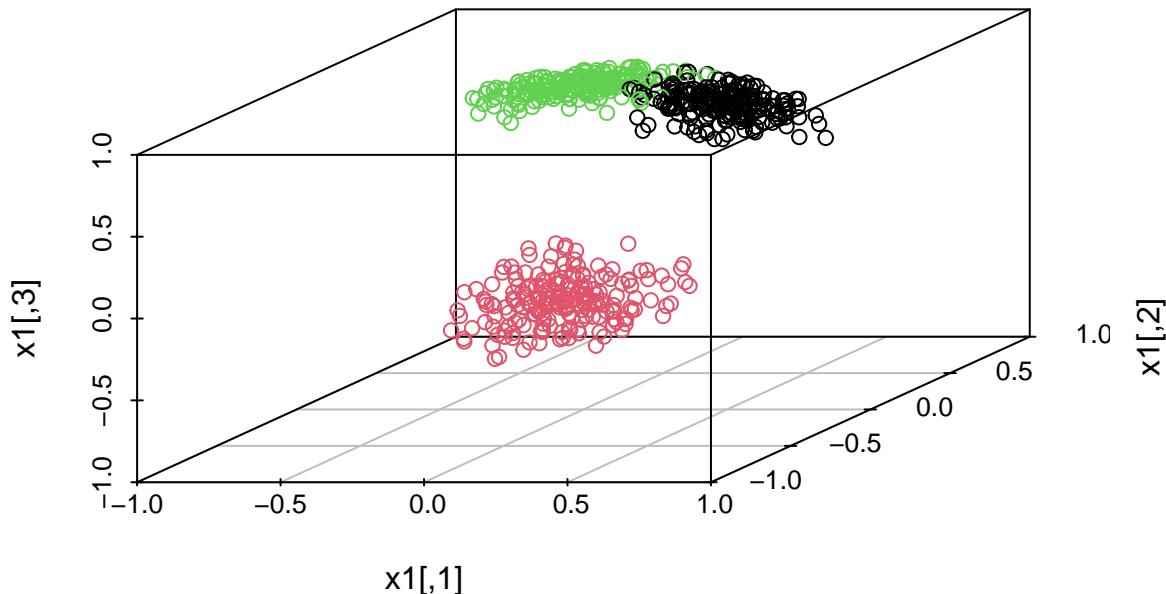
### Case 2

Sample on the  $(\mathbb{S}^2)^2$  where  $p = 2$  and  $r = 2$ .

```
n=200
d=2
r=2
samp1 <- rotasym::r_vMF(n = n, mu = drop(DirStats::to_sph(th = 0, ph = 0.5)),
                           kappa = 50)
samp2 <- rotasym::r_vMF(n = n, mu = drop(DirStats::to_sph(th = 2, ph = -1.5)),
                           kappa = 50)
samp3 <- rotasym::r_vMF(n = n, mu = drop(DirStats::to_sph(th = -1, ph = 0)),
                           kappa = 50)
x1 <- rbind(samp1, samp2, samp3)

scatterplot3d::scatterplot3d(x1,
                             xlim = c(-1, 1), ylim = c(-1, 1), zlim = c(-1, 1),
                             color = rep(1:3, each = n), main="Sphere 1")
```

## Sphere 1



```

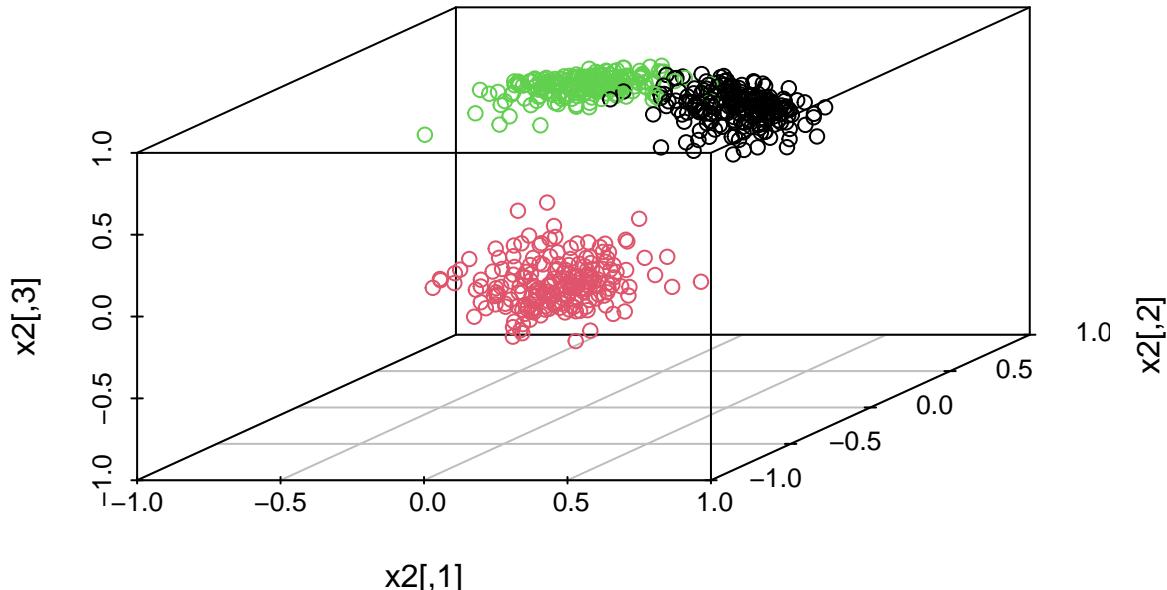
rgl::plot3d(0, 0, 0, xlim = c(-1, 1), ylim = c(-1, 1), zlim = c(-1, 1),
            radius = 1, type = "s", col = "lightblue", alpha = 0.25,
            lit = FALSE)
rgl::points3d(x1, col = rep(c(1,2,3), each=n))

samp4 <- rotasym::r_vMF(n = n, mu = drop(DirStats::to_sph(th = 0, ph = 0.55)),
                           kappa = 60)
samp5 <- rotasym::r_vMF(n = n, mu = drop(DirStats::to_sph(th = 2, ph = -1.41)),
                           kappa = 60)
samp6 <- rotasym::r_vMF(n = n, mu = drop(DirStats::to_sph(th = -1.1, ph = 0.05)),
                           kappa = 60)
x2 <- rbind(samp4, samp5, samp6)

scatterplot3d::scatterplot3d(x2,
                             xlim = c(-1, 1), ylim = c(-1, 1), zlim = c(-1, 1),
                             color = rep(1:3, each = n), main="Sphere 2")

```

## Sphere 2



```
rgl::plot3d(0, 0, 0, xlim = c(-1, 1), ylim = c(-1, 1), zlim = c(-1, 1),
            radius = 1, type = "s", col = "lightblue", alpha = 0.25,
            lit = FALSE)
rgl::points3d(x2, col = rep(c(1,2,3), each=n))

x_2 <- array(dim = c(n*3, 3, 2))
x_2[, , 1] <- x1
x_2[, , 2] <- x2

n <- nrow(x_2)
indexes <- sample(1:n)
x_2 <- x_2[indexes,,]
colors <- rep(c(1, 2, 3), each = n / 3)[indexes]
```

Let's calculate the rho parameters based on a perplexity of 20:

```
rho_second_perp20 <- rho_optim_bst(x_2, 20)
```

```
## Time difference of 52.73877 secs
```

First, let's reduce to dimension  $\mathbb{S}^1$  then  $d = 1$  (circumference):

```
res_pscsne <- psc_sne(X=x_2, d=1, rho_psc_list = rho_second_perp20,
                        num_iteration=500, colors=colors, show_prog = TRUE)
```

```
## It: 1; obj: 1.858e+01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.367e-01; mom: 0.000e+00;
## best it: 1; best obj: 1.858e+01
```

```
## It: 2; obj: 1.788e+01; abs: 6.994e-01; rel: 3.765e-02; norm: 2.600e-01; mom: 5.576e+00;
## best it: 2; best obj: 1.788e+01
```

```
## It: 3; obj: 1.740e+01; abs: 4.821e-01; rel: 2.697e-02; norm: 3.466e-01; mom: 3.356e+00;
## best it: 3; best obj: 1.740e+01
```

```
## It: 4; obj: 1.707e+01; abs: 3.264e-01; rel: 1.877e-02; norm: 4.164e-01; mom: 2.433e+00;
```

```

## best it: 4; best obj: 1.707e+01
## It: 5; obj: 1.684e+01; abs: 2.281e-01; rel: 1.336e-02; norm: 4.755e-01; mom: 1.980e+00;
## best it: 5; best obj: 1.684e+01
## It: 6; obj: 1.666e+01; abs: 1.805e-01; rel: 1.072e-02; norm: 5.232e-01; mom: 1.448e+00;
## best it: 6; best obj: 1.666e+01
## It: 7; obj: 1.653e+01; abs: 1.268e-01; rel: 7.611e-03; norm: 5.612e-01; mom: 1.236e+00;
## best it: 7; best obj: 1.653e+01
## It: 8; obj: 1.643e+01; abs: 1.042e-01; rel: 6.300e-03; norm: 5.842e-01; mom: 9.405e-01;
## best it: 8; best obj: 1.643e+01
## It: 9; obj: 1.634e+01; abs: 9.192e-02; rel: 5.595e-03; norm: 6.010e-01; mom: 8.035e-01;
## best it: 9; best obj: 1.634e+01
## It: 10; obj: 1.625e+01; abs: 9.032e-02; rel: 5.528e-03; norm: 6.137e-01; mom: 7.490e-01;
## best it: 10; best obj: 1.625e+01
## It: 11; obj: 1.616e+01; abs: 8.838e-02; rel: 5.440e-03; norm: 6.262e-01; mom: 7.256e-01;
## best it: 11; best obj: 1.616e+01
## It: 12; obj: 1.608e+01; abs: 7.889e-02; rel: 4.882e-03; norm: 6.377e-01; mom: 7.387e-01;
## best it: 12; best obj: 1.608e+01
## It: 13; obj: 1.600e+01; abs: 7.776e-02; rel: 4.836e-03; norm: 6.495e-01; mom: 7.398e-01;
## best it: 13; best obj: 1.600e+01
## It: 14; obj: 1.592e+01; abs: 8.158e-02; rel: 5.098e-03; norm: 6.630e-01; mom: 8.177e-01;
## best it: 14; best obj: 1.592e+01
## It: 15; obj: 1.586e+01; abs: 6.315e-02; rel: 3.967e-03; norm: 6.799e-01; mom: 7.879e-01;
## best it: 15; best obj: 1.586e+01
## It: 16; obj: 1.581e+01; abs: 4.880e-02; rel: 3.077e-03; norm: 6.967e-01; mom: 7.007e-01;
## best it: 16; best obj: 1.581e+01
## It: 17; obj: 1.576e+01; abs: 4.492e-02; rel: 2.841e-03; norm: 7.111e-01; mom: 6.597e-01;
## best it: 17; best obj: 1.576e+01
## It: 18; obj: 1.572e+01; abs: 4.793e-02; rel: 3.040e-03; norm: 7.239e-01; mom: 6.590e-01;
## best it: 18; best obj: 1.572e+01
## It: 19; obj: 1.567e+01; abs: 4.691e-02; rel: 2.985e-03; norm: 7.370e-01; mom: 6.656e-01;
## best it: 19; best obj: 1.567e+01
## It: 20; obj: 1.563e+01; abs: 4.368e-02; rel: 2.788e-03; norm: 7.520e-01; mom: 6.355e-01;
## best it: 20; best obj: 1.563e+01
## It: 21; obj: 1.559e+01; abs: 3.733e-02; rel: 2.389e-03; norm: 7.676e-01; mom: 6.229e-01;
## best it: 21; best obj: 1.559e+01
## It: 22; obj: 1.556e+01; abs: 2.550e-02; rel: 1.636e-03; norm: 7.828e-01; mom: 5.984e-01;
## best it: 22; best obj: 1.556e+01
## It: 23; obj: 1.555e+01; abs: 1.389e-02; rel: 8.923e-04; norm: 7.976e-01; mom: 5.450e-01;
## best it: 23; best obj: 1.555e+01
## It: 24; obj: 1.554e+01; abs: 6.546e-03; rel: 4.210e-04; norm: 8.114e-01; mom: 4.913e-01;
## best it: 24; best obj: 1.554e+01
## It: 25; obj: 1.554e+01; abs: 3.038e-03; rel: 1.954e-04; norm: 8.243e-01; mom: 4.613e-01;
## best it: 25; best obj: 1.554e+01

## It: 26; obj: 1.554e+01; abs: 1.952e-04; rel: 1.256e-05; norm: 8.365e-01; mom: 4.609e-01;
## best it: 26; best obj: 1.554e+01
## It: 27; obj: 1.554e+01; abs: 1.105e-03; rel: 7.111e-05; norm: 8.481e-01; mom: 4.474e-01;
## best it: 26; best obj: 1.554e+01
## It: 28; obj: 1.554e+01; abs: 9.265e-04; rel: 5.962e-05; norm: 8.592e-01; mom: 4.215e-01;
## best it: 26; best obj: 1.554e+01
## It: 29; obj: 1.553e+01; abs: 5.171e-03; rel: 3.328e-04; norm: 8.699e-01; mom: 4.263e-01;
## best it: 29; best obj: 1.553e+01
## It: 30; obj: 1.552e+01; abs: 1.043e-02; rel: 6.714e-04; norm: 8.805e-01; mom: 4.335e-01;
## best it: 30; best obj: 1.552e+01

```

```

## It: 31; obj: 1.551e+01; abs: 1.800e-02; rel: 1.159e-03; norm: 8.911e-01; mom: 4.340e-01;
## best it: 31; best obj: 1.551e+01
## It: 32; obj: 1.548e+01; abs: 2.572e-02; rel: 1.659e-03; norm: 9.017e-01; mom: 4.615e-01;
## best it: 32; best obj: 1.548e+01
## It: 33; obj: 1.545e+01; abs: 2.922e-02; rel: 1.888e-03; norm: 9.120e-01; mom: 4.966e-01;
## best it: 33; best obj: 1.545e+01
## It: 34; obj: 1.542e+01; abs: 2.645e-02; rel: 1.712e-03; norm: 9.215e-01; mom: 5.064e-01;
## best it: 34; best obj: 1.542e+01
## It: 35; obj: 1.540e+01; abs: 2.080e-02; rel: 1.349e-03; norm: 9.292e-01; mom: 4.805e-01;
## best it: 35; best obj: 1.540e+01
## It: 36; obj: 1.539e+01; abs: 1.435e-02; rel: 9.319e-04; norm: 9.348e-01; mom: 4.533e-01;
## best it: 36; best obj: 1.539e+01
## It: 37; obj: 1.538e+01; abs: 7.269e-03; rel: 4.723e-04; norm: 9.385e-01; mom: 4.158e-01;
## best it: 37; best obj: 1.538e+01
## It: 38; obj: 1.538e+01; abs: 2.298e-03; rel: 1.494e-04; norm: 9.403e-01; mom: 3.574e-01;
## best it: 38; best obj: 1.538e+01
## It: 39; obj: 1.538e+01; abs: 2.200e-03; rel: 1.431e-04; norm: 9.407e-01; mom: 3.036e-01;
## best it: 39; best obj: 1.538e+01
## It: 40; obj: 1.537e+01; abs: 3.137e-03; rel: 2.040e-04; norm: 9.404e-01; mom: 2.868e-01;
## best it: 40; best obj: 1.537e+01
## It: 41; obj: 1.537e+01; abs: 1.743e-04; rel: 1.134e-05; norm: 9.399e-01; mom: 2.807e-01;
## best it: 40; best obj: 1.537e+01
## It: 42; obj: 1.538e+01; abs: 3.144e-03; rel: 2.045e-04; norm: 9.391e-01; mom: 2.384e-01;
## best it: 40; best obj: 1.537e+01
## It: 43; obj: 1.538e+01; abs: 4.118e-03; rel: 2.678e-04; norm: 9.377e-01; mom: 1.888e-01;
## best it: 40; best obj: 1.537e+01
## It: 44; obj: 1.539e+01; abs: 4.011e-03; rel: 2.608e-04; norm: 9.362e-01; mom: 1.591e-01;
## best it: 40; best obj: 1.537e+01
## It: 45; obj: 1.539e+01; abs: 2.456e-03; rel: 1.596e-04; norm: 9.345e-01; mom: 1.556e-01;
## best it: 40; best obj: 1.537e+01
## It: 46; obj: 1.538e+01; abs: 3.856e-03; rel: 2.505e-04; norm: 9.329e-01; mom: 1.863e-01;
## best it: 40; best obj: 1.537e+01
## It: 47; obj: 1.537e+01; abs: 1.174e-02; rel: 7.629e-04; norm: 9.317e-01; mom: 2.746e-01;
## best it: 47; best obj: 1.537e+01
## It: 48; obj: 1.537e+01; abs: 3.163e-03; rel: 2.057e-04; norm: 9.314e-01; mom: 3.908e-01;
## best it: 48; best obj: 1.537e+01
## It: 49; obj: 1.537e+01; abs: 9.900e-05; rel: 6.442e-06; norm: 9.305e-01; mom: 2.572e-01;
## best it: 49; best obj: 1.537e+01
## It: 50; obj: 1.537e+01; abs: 2.029e-03; rel: 1.320e-04; norm: 9.290e-01; mom: 1.771e-01;
## best it: 50; best obj: 1.537e+01

## It: 51; obj: 1.536e+01; abs: 5.528e-03; rel: 3.597e-04; norm: 9.274e-01; mom: 2.027e-01;
## best it: 51; best obj: 1.536e+01
## It: 52; obj: 1.535e+01; abs: 9.694e-03; rel: 6.311e-04; norm: 9.260e-01; mom: 2.332e-01;
## best it: 52; best obj: 1.535e+01
## It: 53; obj: 1.534e+01; abs: 1.240e-02; rel: 8.079e-04; norm: 9.251e-01; mom: 2.590e-01;
## best it: 53; best obj: 1.534e+01
## It: 54; obj: 1.533e+01; abs: 1.051e-02; rel: 6.851e-04; norm: 9.245e-01; mom: 2.827e-01;
## best it: 54; best obj: 1.533e+01
## It: 55; obj: 1.532e+01; abs: 1.176e-02; rel: 7.672e-04; norm: 9.236e-01; mom: 2.659e-01;
## best it: 55; best obj: 1.532e+01
## It: 56; obj: 1.530e+01; abs: 1.439e-02; rel: 9.394e-04; norm: 9.226e-01; mom: 2.735e-01;
## best it: 56; best obj: 1.530e+01
## It: 57; obj: 1.529e+01; abs: 8.572e-03; rel: 5.602e-04; norm: 9.215e-01; mom: 3.032e-01;

```

```

## best it: 57; best obj: 1.529e+01
## It: 58; obj: 1.529e+01; abs: 4.043e-03; rel: 2.644e-04; norm: 9.198e-01; mom: 2.402e-01;
## best it: 58; best obj: 1.529e+01
## It: 59; obj: 1.529e+01; abs: 2.286e-03; rel: 1.495e-04; norm: 9.176e-01; mom: 1.748e-01;
## best it: 59; best obj: 1.529e+01
## It: 60; obj: 1.529e+01; abs: 1.789e-03; rel: 1.170e-04; norm: 9.152e-01; mom: 1.302e-01;
## best it: 60; best obj: 1.529e+01
## It: 61; obj: 1.528e+01; abs: 1.712e-03; rel: 1.120e-04; norm: 9.127e-01; mom: 1.008e-01;
## best it: 61; best obj: 1.528e+01
## It: 62; obj: 1.528e+01; abs: 1.737e-03; rel: 1.136e-04; norm: 9.102e-01; mom: 8.149e-02;
## best it: 62; best obj: 1.528e+01
## It: 63; obj: 1.528e+01; abs: 1.766e-03; rel: 1.156e-04; norm: 9.077e-01; mom: 6.854e-02;
## best it: 63; best obj: 1.528e+01
## It: 64; obj: 1.528e+01; abs: 1.777e-03; rel: 1.163e-04; norm: 9.053e-01; mom: 5.958e-02;
## best it: 64; best obj: 1.528e+01
## It: 65; obj: 1.528e+01; abs: 1.770e-03; rel: 1.158e-04; norm: 9.030e-01; mom: 5.316e-02;
## best it: 65; best obj: 1.528e+01
## It: 66; obj: 1.528e+01; abs: 1.748e-03; rel: 1.144e-04; norm: 9.007e-01; mom: 4.840e-02;
## best it: 66; best obj: 1.528e+01
## It: 67; obj: 1.527e+01; abs: 1.716e-03; rel: 1.123e-04; norm: 8.984e-01; mom: 4.478e-02;
## best it: 67; best obj: 1.527e+01
## It: 68; obj: 1.527e+01; abs: 1.676e-03; rel: 1.097e-04; norm: 8.963e-01; mom: 4.199e-02;
## best it: 68; best obj: 1.527e+01
## It: 69; obj: 1.527e+01; abs: 1.633e-03; rel: 1.069e-04; norm: 8.942e-01; mom: 3.981e-02;
## best it: 69; best obj: 1.527e+01
## It: 70; obj: 1.527e+01; abs: 1.587e-03; rel: 1.039e-04; norm: 8.922e-01; mom: 3.805e-02;
## best it: 70; best obj: 1.527e+01
## It: 71; obj: 1.527e+01; abs: 1.540e-03; rel: 1.008e-04; norm: 8.902e-01; mom: 3.657e-02;
## best it: 71; best obj: 1.527e+01
## It: 72; obj: 1.527e+01; abs: 1.492e-03; rel: 9.772e-05; norm: 8.883e-01; mom: 3.527e-02;
## best it: 72; best obj: 1.527e+01
## It: 73; obj: 1.526e+01; abs: 1.445e-03; rel: 9.464e-05; norm: 8.864e-01; mom: 3.411e-02;
## best it: 73; best obj: 1.526e+01
## It: 74; obj: 1.526e+01; abs: 1.398e-03; rel: 9.160e-05; norm: 8.846e-01; mom: 3.304e-02;
## best it: 74; best obj: 1.526e+01
## It: 75; obj: 1.526e+01; abs: 1.353e-03; rel: 8.863e-05; norm: 8.829e-01; mom: 3.205e-02;
## best it: 75; best obj: 1.526e+01

## It: 76; obj: 1.526e+01; abs: 1.308e-03; rel: 8.573e-05; norm: 8.812e-01; mom: 3.111e-02;
## best it: 76; best obj: 1.526e+01
## It: 77; obj: 1.526e+01; abs: 1.265e-03; rel: 8.291e-05; norm: 8.796e-01; mom: 3.023e-02;
## best it: 77; best obj: 1.526e+01
## It: 78; obj: 1.526e+01; abs: 1.223e-03; rel: 8.017e-05; norm: 8.780e-01; mom: 2.939e-02;
## best it: 78; best obj: 1.526e+01
## It: 79; obj: 1.526e+01; abs: 1.183e-03; rel: 7.753e-05; norm: 8.764e-01; mom: 2.859e-02;
## best it: 79; best obj: 1.526e+01
## It: 80; obj: 1.526e+01; abs: 1.144e-03; rel: 7.497e-05; norm: 8.749e-01; mom: 2.782e-02;
## best it: 80; best obj: 1.526e+01
## It: 81; obj: 1.525e+01; abs: 1.106e-03; rel: 7.250e-05; norm: 8.734e-01; mom: 2.708e-02;
## best it: 81; best obj: 1.525e+01
## It: 82; obj: 1.525e+01; abs: 1.070e-03; rel: 7.011e-05; norm: 8.720e-01; mom: 2.637e-02;
## best it: 82; best obj: 1.525e+01
## It: 83; obj: 1.525e+01; abs: 1.034e-03; rel: 6.781e-05; norm: 8.706e-01; mom: 2.569e-02;
## best it: 83; best obj: 1.525e+01

```

```

## It: 84; obj: 1.525e+01; abs: 1.000e-03; rel: 6.559e-05; norm: 8.692e-01; mom: 2.504e-02;
## best it: 84; best obj: 1.525e+01
## It: 85; obj: 1.525e+01; abs: 9.676e-04; rel: 6.344e-05; norm: 8.679e-01; mom: 2.441e-02;
## best it: 85; best obj: 1.525e+01
## It: 86; obj: 1.525e+01; abs: 9.360e-04; rel: 6.138e-05; norm: 8.666e-01; mom: 2.380e-02;
## best it: 86; best obj: 1.525e+01
## It: 87; obj: 1.525e+01; abs: 9.056e-04; rel: 5.938e-05; norm: 8.654e-01; mom: 2.321e-02;
## best it: 87; best obj: 1.525e+01
## It: 88; obj: 1.525e+01; abs: 8.762e-04; rel: 5.746e-05; norm: 8.642e-01; mom: 2.264e-02;
## best it: 88; best obj: 1.525e+01
## It: 89; obj: 1.525e+01; abs: 8.479e-04; rel: 5.561e-05; norm: 8.630e-01; mom: 2.209e-02;
## best it: 89; best obj: 1.525e+01
## It: 90; obj: 1.525e+01; abs: 8.207e-04; rel: 5.382e-05; norm: 8.618e-01; mom: 2.155e-02;
## best it: 90; best obj: 1.525e+01
## It: 91; obj: 1.525e+01; abs: 7.943e-04; rel: 5.210e-05; norm: 8.607e-01; mom: 2.103e-02;
## best it: 91; best obj: 1.525e+01
## It: 92; obj: 1.524e+01; abs: 7.690e-04; rel: 5.044e-05; norm: 8.596e-01; mom: 2.053e-02;
## best it: 92; best obj: 1.524e+01
## It: 93; obj: 1.524e+01; abs: 7.445e-04; rel: 4.883e-05; norm: 8.585e-01; mom: 2.005e-02;
## best it: 93; best obj: 1.524e+01
## It: 94; obj: 1.524e+01; abs: 7.209e-04; rel: 4.729e-05; norm: 8.575e-01; mom: 1.957e-02;
## best it: 94; best obj: 1.524e+01
## It: 95; obj: 1.524e+01; abs: 6.981e-04; rel: 4.580e-05; norm: 8.565e-01; mom: 1.911e-02;
## best it: 95; best obj: 1.524e+01
## It: 96; obj: 1.524e+01; abs: 6.761e-04; rel: 4.436e-05; norm: 8.555e-01; mom: 1.867e-02;
## best it: 96; best obj: 1.524e+01
## It: 97; obj: 1.524e+01; abs: 6.549e-04; rel: 4.297e-05; norm: 8.545e-01; mom: 1.824e-02;
## best it: 97; best obj: 1.524e+01
## It: 98; obj: 1.524e+01; abs: 6.344e-04; rel: 4.163e-05; norm: 8.536e-01; mom: 1.782e-02;
## best it: 98; best obj: 1.524e+01
## It: 99; obj: 1.524e+01; abs: 6.147e-04; rel: 4.033e-05; norm: 8.527e-01; mom: 1.741e-02;
## best it: 99; best obj: 1.524e+01
## It: 100; obj: 1.524e+01; abs: 5.956e-04; rel: 3.908e-05; norm: 8.518e-01; mom: 1.701e-02;
## best it: 100; best obj: 1.524e+01

## It: 101; obj: 2.391e+00; abs: 1.285e+01; rel: 8.431e-01; norm: 8.694e-02; mom: 1.662e-02;
## best it: 101; best obj: 2.391e+00
## It: 102; obj: 2.354e+00; abs: 3.773e-02; rel: 1.578e-02; norm: 9.164e-02; mom: 8.079e-01;
## best it: 102; best obj: 2.354e+00
## It: 103; obj: 2.331e+00; abs: 2.266e-02; rel: 9.628e-03; norm: 9.911e-02; mom: 9.620e-01;
## best it: 103; best obj: 2.331e+00
## It: 104; obj: 2.322e+00; abs: 9.187e-03; rel: 3.941e-03; norm: 1.046e-01; mom: 7.586e-01;
## best it: 104; best obj: 2.322e+00
## It: 105; obj: 2.318e+00; abs: 3.844e-03; rel: 1.655e-03; norm: 1.069e-01; mom: 4.768e-01;
## best it: 105; best obj: 2.318e+00
## It: 106; obj: 2.316e+00; abs: 1.824e-03; rel: 7.868e-04; norm: 1.077e-01; mom: 3.205e-01;
## best it: 106; best obj: 2.316e+00
## It: 107; obj: 2.315e+00; abs: 1.431e-03; rel: 6.178e-04; norm: 1.080e-01; mom: 2.797e-01;
## best it: 107; best obj: 2.315e+00
## It: 108; obj: 2.314e+00; abs: 4.117e-04; rel: 1.778e-04; norm: 1.081e-01; mom: 4.459e-01;
## best it: 108; best obj: 2.314e+00
## It: 109; obj: 2.314e+00; abs: 2.343e-04; rel: 1.012e-04; norm: 1.081e-01; mom: 2.723e-01;
## best it: 109; best obj: 2.314e+00
## It: 110; obj: 2.314e+00; abs: 3.431e-04; rel: 1.482e-04; norm: 1.082e-01; mom: 1.999e-01;

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## best it: 110; best obj: 2.314e+00
## It: 111; obj: 2.314e+00; abs: 2.500e-04; rel: 1.080e-04; norm: 1.084e-01; mom: 1.403e-01;
## best it: 111; best obj: 2.314e+00
## It: 112; obj: 2.313e+00; abs: 8.360e-05; rel: 3.613e-05; norm: 1.085e-01; mom: 1.701e-01;
## best it: 112; best obj: 2.313e+00
## It: 113; obj: 2.313e+00; abs: 1.298e-04; rel: 5.609e-05; norm: 1.085e-01; mom: 1.218e-01;
## best it: 113; best obj: 2.313e+00
## It: 114; obj: 2.313e+00; abs: 6.807e-05; rel: 2.942e-05; norm: 1.086e-01; mom: 9.262e-02;
## best it: 114; best obj: 2.313e+00
## It: 115; obj: 2.313e+00; abs: 5.313e-05; rel: 2.297e-05; norm: 1.086e-01; mom: 1.132e-01;
## best it: 115; best obj: 2.313e+00
## It: 116; obj: 2.313e+00; abs: 8.723e-05; rel: 3.771e-05; norm: 1.086e-01; mom: 5.990e-02;
## best it: 116; best obj: 2.313e+00
## It: 117; obj: 2.313e+00; abs: 5.739e-05; rel: 2.481e-05; norm: 1.087e-01; mom: 6.059e-02;
## best it: 117; best obj: 2.313e+00
## It: 118; obj: 2.313e+00; abs: 4.423e-05; rel: 1.912e-05; norm: 1.088e-01; mom: 7.135e-02;
## best it: 118; best obj: 2.313e+00
## It: 119; obj: 2.313e+00; abs: 6.399e-05; rel: 2.766e-05; norm: 1.088e-01; mom: 4.783e-02;
## best it: 119; best obj: 2.313e+00
## It: 120; obj: 2.313e+00; abs: 5.512e-05; rel: 2.383e-05; norm: 1.089e-01; mom: 4.266e-02;
## best it: 120; best obj: 2.313e+00
## It: 121; obj: 2.313e+00; abs: 4.829e-05; rel: 2.088e-05; norm: 1.089e-01; mom: 5.275e-02;
## best it: 121; best obj: 2.313e+00
## It: 122; obj: 2.313e+00; abs: 5.401e-05; rel: 2.335e-05; norm: 1.089e-01; mom: 4.167e-02;
## best it: 122; best obj: 2.313e+00
## It: 123; obj: 2.313e+00; abs: 5.107e-05; rel: 2.208e-05; norm: 1.090e-01; mom: 3.969e-02;
## best it: 123; best obj: 2.313e+00
## It: 124; obj: 2.313e+00; abs: 4.610e-05; rel: 1.993e-05; norm: 1.090e-01; mom: 4.222e-02;
## best it: 124; best obj: 2.313e+00
## It: 125; obj: 2.313e+00; abs: 4.511e-05; rel: 1.950e-05; norm: 1.091e-01; mom: 3.763e-02;
## best it: 125; best obj: 2.313e+00

## It: 126; obj: 2.313e+00; abs: 4.188e-05; rel: 1.811e-05; norm: 1.091e-01; mom: 3.585e-02;
## best it: 126; best obj: 2.313e+00
## It: 127; obj: 2.313e+00; abs: 3.812e-05; rel: 1.648e-05; norm: 1.092e-01; mom: 3.568e-02;
## best it: 127; best obj: 2.313e+00
## It: 128; obj: 2.313e+00; abs: 3.529e-05; rel: 1.526e-05; norm: 1.092e-01; mom: 3.241e-02;
## best it: 128; best obj: 2.313e+00
## It: 129; obj: 2.313e+00; abs: 3.207e-05; rel: 1.387e-05; norm: 1.092e-01; mom: 3.049e-02;
## best it: 129; best obj: 2.313e+00
## It: 130; obj: 2.313e+00; abs: 2.926e-05; rel: 1.265e-05; norm: 1.093e-01; mom: 2.934e-02;
## best it: 130; best obj: 2.313e+00
## It: 131; obj: 2.312e+00; abs: 2.700e-05; rel: 1.168e-05; norm: 1.093e-01; mom: 2.713e-02;
## best it: 131; best obj: 2.312e+00
## It: 132; obj: 2.312e+00; abs: 2.477e-05; rel: 1.071e-05; norm: 1.093e-01; mom: 2.576e-02;
## best it: 132; best obj: 2.312e+00
## It: 133; obj: 2.312e+00; abs: 2.295e-05; rel: 9.925e-06; norm: 1.093e-01; mom: 2.481e-02;
## best it: 133; best obj: 2.312e+00
## It: 134; obj: 2.312e+00; abs: 2.147e-05; rel: 9.283e-06; norm: 1.093e-01; mom: 2.355e-02;
## best it: 134; best obj: 2.312e+00
## It: 135; obj: 2.312e+00; abs: 2.009e-05; rel: 8.687e-06; norm: 1.094e-01; mom: 2.285e-02;
## best it: 135; best obj: 2.312e+00
## It: 136; obj: 2.312e+00; abs: 1.899e-05; rel: 8.211e-06; norm: 1.094e-01; mom: 2.241e-02;
## best it: 136; best obj: 2.312e+00

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## It: 137; obj: 2.312e+00; abs: 1.814e-05; rel: 7.846e-06; norm: 1.094e-01; mom: 2.193e-02;
## best it: 137; best obj: 2.312e+00
## It: 138; obj: 2.312e+00; abs: 1.743e-05; rel: 7.537e-06; norm: 1.094e-01; mom: 2.168e-02;
## best it: 138; best obj: 2.312e+00
## It: 139; obj: 2.312e+00; abs: 1.688e-05; rel: 7.301e-06; norm: 1.094e-01; mom: 2.153e-02;
## best it: 139; best obj: 2.312e+00
## It: 140; obj: 2.312e+00; abs: 1.650e-05; rel: 7.134e-06; norm: 1.094e-01; mom: 2.135e-02;
## best it: 140; best obj: 2.312e+00
## It: 141; obj: 2.312e+00; abs: 1.621e-05; rel: 7.012e-06; norm: 1.094e-01; mom: 2.126e-02;
## best it: 141; best obj: 2.312e+00
## It: 142; obj: 2.312e+00; abs: 1.604e-05; rel: 6.939e-06; norm: 1.094e-01; mom: 2.124e-02;
## best it: 142; best obj: 2.312e+00
## It: 143; obj: 2.312e+00; abs: 1.598e-05; rel: 6.911e-06; norm: 1.094e-01; mom: 2.124e-02;
## best it: 143; best obj: 2.312e+00
## It: 144; obj: 2.312e+00; abs: 1.599e-05; rel: 6.917e-06; norm: 1.094e-01; mom: 2.131e-02;
## best it: 144; best obj: 2.312e+00
## It: 145; obj: 2.312e+00; abs: 1.608e-05; rel: 6.955e-06; norm: 1.095e-01; mom: 2.142e-02;
## best it: 145; best obj: 2.312e+00
## It: 146; obj: 2.312e+00; abs: 1.623e-05; rel: 7.019e-06; norm: 1.095e-01; mom: 2.154e-02;
## best it: 146; best obj: 2.312e+00
## It: 147; obj: 2.312e+00; abs: 1.642e-05; rel: 7.102e-06; norm: 1.095e-01; mom: 2.168e-02;
## best it: 147; best obj: 2.312e+00
## It: 148; obj: 2.312e+00; abs: 1.665e-05; rel: 7.200e-06; norm: 1.095e-01; mom: 2.183e-02;
## best it: 148; best obj: 2.312e+00
## It: 149; obj: 2.312e+00; abs: 1.690e-05; rel: 7.308e-06; norm: 1.095e-01; mom: 2.197e-02;
## best it: 149; best obj: 2.312e+00
## It: 150; obj: 2.312e+00; abs: 1.716e-05; rel: 7.422e-06; norm: 1.095e-01; mom: 2.211e-02;
## best it: 150; best obj: 2.312e+00

## It: 151; obj: 2.312e+00; abs: 1.743e-05; rel: 7.538e-06; norm: 1.095e-01; mom: 2.225e-02;
## best it: 151; best obj: 2.312e+00
## It: 152; obj: 2.312e+00; abs: 1.770e-05; rel: 7.654e-06; norm: 1.095e-01; mom: 2.238e-02;
## best it: 152; best obj: 2.312e+00
## It: 153; obj: 2.312e+00; abs: 1.796e-05; rel: 7.768e-06; norm: 1.095e-01; mom: 2.249e-02;
## best it: 153; best obj: 2.312e+00
## It: 154; obj: 2.312e+00; abs: 1.821e-05; rel: 7.876e-06; norm: 1.095e-01; mom: 2.257e-02;
## best it: 154; best obj: 2.312e+00
## It: 155; obj: 2.312e+00; abs: 1.844e-05; rel: 7.975e-06; norm: 1.095e-01; mom: 2.264e-02;
## best it: 155; best obj: 2.312e+00
## It: 156; obj: 2.312e+00; abs: 1.865e-05; rel: 8.065e-06; norm: 1.095e-01; mom: 2.269e-02;
## best it: 156; best obj: 2.312e+00
## It: 157; obj: 2.312e+00; abs: 1.883e-05; rel: 8.143e-06; norm: 1.095e-01; mom: 2.271e-02;
## best it: 157; best obj: 2.312e+00
## It: 158; obj: 2.312e+00; abs: 1.898e-05; rel: 8.208e-06; norm: 1.095e-01; mom: 2.272e-02;
## best it: 158; best obj: 2.312e+00
## It: 159; obj: 2.312e+00; abs: 1.909e-05; rel: 8.257e-06; norm: 1.095e-01; mom: 2.270e-02;
## best it: 159; best obj: 2.312e+00
## It: 160; obj: 2.312e+00; abs: 1.916e-05; rel: 8.289e-06; norm: 1.095e-01; mom: 2.265e-02;
## best it: 160; best obj: 2.312e+00
## It: 161; obj: 2.312e+00; abs: 1.919e-05; rel: 8.302e-06; norm: 1.095e-01; mom: 2.258e-02;
## best it: 161; best obj: 2.312e+00
## It: 162; obj: 2.312e+00; abs: 1.918e-05; rel: 8.296e-06; norm: 1.095e-01; mom: 2.247e-02;
## best it: 162; best obj: 2.312e+00
## It: 163; obj: 2.312e+00; abs: 1.912e-05; rel: 8.269e-06; norm: 1.095e-01; mom: 2.234e-02;

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## best it: 163; best obj: 2.312e+00
## It: 164; obj: 2.312e+00; abs: 1.901e-05; rel: 8.221e-06; norm: 1.095e-01; mom: 2.218e-02;
## best it: 164; best obj: 2.312e+00
## It: 165; obj: 2.312e+00; abs: 1.885e-05; rel: 8.153e-06; norm: 1.095e-01; mom: 2.200e-02;
## best it: 165; best obj: 2.312e+00
## It: 166; obj: 2.312e+00; abs: 1.864e-05; rel: 8.064e-06; norm: 1.095e-01; mom: 2.178e-02;
## best it: 166; best obj: 2.312e+00
## It: 167; obj: 2.312e+00; abs: 1.839e-05; rel: 7.955e-06; norm: 1.095e-01; mom: 2.154e-02;
## best it: 167; best obj: 2.312e+00
## It: 168; obj: 2.312e+00; abs: 1.810e-05; rel: 7.828e-06; norm: 1.095e-01; mom: 2.127e-02;
## best it: 168; best obj: 2.312e+00
## It: 169; obj: 2.312e+00; abs: 1.776e-05; rel: 7.683e-06; norm: 1.095e-01; mom: 2.098e-02;
## best it: 169; best obj: 2.312e+00
## It: 170; obj: 2.312e+00; abs: 1.739e-05; rel: 7.523e-06; norm: 1.095e-01; mom: 2.068e-02;
## best it: 170; best obj: 2.312e+00
## It: 171; obj: 2.312e+00; abs: 1.699e-05; rel: 7.348e-06; norm: 1.095e-01; mom: 2.037e-02;
## best it: 171; best obj: 2.312e+00
## It: 172; obj: 2.312e+00; abs: 1.656e-05; rel: 7.162e-06; norm: 1.095e-01; mom: 2.004e-02;
## best it: 172; best obj: 2.312e+00
## It: 173; obj: 2.312e+00; abs: 1.610e-05; rel: 6.964e-06; norm: 1.095e-01; mom: 1.972e-02;
## best it: 173; best obj: 2.312e+00
## It: 174; obj: 2.312e+00; abs: 1.562e-05; rel: 6.759e-06; norm: 1.096e-01; mom: 1.940e-02;
## best it: 174; best obj: 2.312e+00
## It: 175; obj: 2.312e+00; abs: 1.513e-05; rel: 6.546e-06; norm: 1.096e-01; mom: 1.910e-02;
## best it: 175; best obj: 2.312e+00

## It: 176; obj: 2.312e+00; abs: 1.463e-05; rel: 6.328e-06; norm: 1.096e-01; mom: 1.880e-02;
## best it: 176; best obj: 2.312e+00
## It: 177; obj: 2.312e+00; abs: 1.412e-05; rel: 6.107e-06; norm: 1.096e-01; mom: 1.852e-02;
## best it: 177; best obj: 2.312e+00
## It: 178; obj: 2.312e+00; abs: 1.360e-05; rel: 5.883e-06; norm: 1.096e-01; mom: 1.826e-02;
## best it: 178; best obj: 2.312e+00
## It: 179; obj: 2.312e+00; abs: 1.308e-05; rel: 5.658e-06; norm: 1.096e-01; mom: 1.800e-02;
## best it: 179; best obj: 2.312e+00
## It: 180; obj: 2.312e+00; abs: 1.256e-05; rel: 5.433e-06; norm: 1.096e-01; mom: 1.775e-02;
## best it: 180; best obj: 2.312e+00
## It: 181; obj: 2.312e+00; abs: 1.204e-05; rel: 5.209e-06; norm: 1.096e-01; mom: 1.750e-02;
## best it: 181; best obj: 2.312e+00
## It: 182; obj: 2.312e+00; abs: 1.153e-05; rel: 4.987e-06; norm: 1.096e-01; mom: 1.725e-02;
## best it: 182; best obj: 2.312e+00
## It: 183; obj: 2.312e+00; abs: 1.102e-05; rel: 4.767e-06; norm: 1.096e-01; mom: 1.699e-02;
## best it: 183; best obj: 2.312e+00
## It: 184; obj: 2.312e+00; abs: 1.052e-05; rel: 4.550e-06; norm: 1.096e-01; mom: 1.673e-02;
## best it: 184; best obj: 2.312e+00
## It: 185; obj: 2.312e+00; abs: 1.003e-05; rel: 4.337e-06; norm: 1.096e-01; mom: 1.645e-02;
## best it: 185; best obj: 2.312e+00
## It: 186; obj: 2.312e+00; abs: 9.541e-06; rel: 4.128e-06; norm: 1.096e-01; mom: 1.616e-02;
## best it: 186; best obj: 2.312e+00
## It: 187; obj: 2.312e+00; abs: 9.067e-06; rel: 3.923e-06; norm: 1.096e-01; mom: 1.586e-02;
## best it: 187; best obj: 2.312e+00
## It: 188; obj: 2.312e+00; abs: 8.604e-06; rel: 3.722e-06; norm: 1.096e-01; mom: 1.555e-02;
## best it: 188; best obj: 2.312e+00
## It: 189; obj: 2.312e+00; abs: 8.153e-06; rel: 3.527e-06; norm: 1.097e-01; mom: 1.522e-02;
## best it: 189; best obj: 2.312e+00

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## It: 190; obj: 2.312e+00; abs: 7.715e-06; rel: 3.338e-06; norm: 1.097e-01; mom: 1.488e-02;
## best it: 190; best obj: 2.312e+00
## It: 191; obj: 2.312e+00; abs: 7.290e-06; rel: 3.154e-06; norm: 1.097e-01; mom: 1.453e-02;
## best it: 191; best obj: 2.312e+00
## It: 192; obj: 2.312e+00; abs: 6.879e-06; rel: 2.976e-06; norm: 1.097e-01; mom: 1.417e-02;
## best it: 192; best obj: 2.312e+00
## It: 193; obj: 2.312e+00; abs: 6.483e-06; rel: 2.805e-06; norm: 1.097e-01; mom: 1.381e-02;
## best it: 193; best obj: 2.312e+00
## It: 194; obj: 2.311e+00; abs: 6.102e-06; rel: 2.640e-06; norm: 1.097e-01; mom: 1.343e-02;
## best it: 194; best obj: 2.311e+00
## It: 195; obj: 2.311e+00; abs: 5.736e-06; rel: 2.482e-06; norm: 1.097e-01; mom: 1.306e-02;
## best it: 195; best obj: 2.311e+00
## It: 196; obj: 2.311e+00; abs: 5.386e-06; rel: 2.330e-06; norm: 1.097e-01; mom: 1.268e-02;
## best it: 196; best obj: 2.311e+00
## It: 197; obj: 2.311e+00; abs: 5.053e-06; rel: 2.186e-06; norm: 1.097e-01; mom: 1.229e-02;
## best it: 197; best obj: 2.311e+00
## It: 198; obj: 2.311e+00; abs: 4.735e-06; rel: 2.048e-06; norm: 1.097e-01; mom: 1.191e-02;
## best it: 198; best obj: 2.311e+00
## It: 199; obj: 2.311e+00; abs: 4.433e-06; rel: 1.918e-06; norm: 1.097e-01; mom: 1.153e-02;
## best it: 199; best obj: 2.311e+00
## It: 200; obj: 2.311e+00; abs: 4.148e-06; rel: 1.794e-06; norm: 1.097e-01; mom: 1.115e-02;
## best it: 200; best obj: 2.311e+00

## It: 201; obj: 2.311e+00; abs: 3.878e-06; rel: 1.678e-06; norm: 1.097e-01; mom: 1.078e-02;
## best it: 201; best obj: 2.311e+00
## It: 202; obj: 2.311e+00; abs: 3.623e-06; rel: 1.568e-06; norm: 1.097e-01; mom: 1.041e-02;
## best it: 202; best obj: 2.311e+00
## It: 203; obj: 2.311e+00; abs: 3.384e-06; rel: 1.464e-06; norm: 1.097e-01; mom: 1.004e-02;
## best it: 203; best obj: 2.311e+00
## It: 204; obj: 2.311e+00; abs: 3.159e-06; rel: 1.367e-06; norm: 1.097e-01; mom: 9.688e-03;
## best it: 204; best obj: 2.311e+00
## It: 205; obj: 2.311e+00; abs: 2.949e-06; rel: 1.276e-06; norm: 1.097e-01; mom: 9.341e-03;
## best it: 205; best obj: 2.311e+00
## It: 206; obj: 2.311e+00; abs: 2.752e-06; rel: 1.191e-06; norm: 1.097e-01; mom: 9.003e-03;
## best it: 206; best obj: 2.311e+00
## It: 207; obj: 2.311e+00; abs: 2.568e-06; rel: 1.111e-06; norm: 1.097e-01; mom: 8.674e-03;
## best it: 207; best obj: 2.311e+00
## It: 208; obj: 2.311e+00; abs: 2.397e-06; rel: 1.037e-06; norm: 1.097e-01; mom: 8.357e-03;
## best it: 208; best obj: 2.311e+00
## It: 209; obj: 2.311e+00; abs: 2.238e-06; rel: 9.682e-07; norm: 1.097e-01; mom: 8.050e-03;
## best it: 209; best obj: 2.311e+00
## It: 210; obj: 2.311e+00; abs: 2.090e-06; rel: 9.041e-07; norm: 1.097e-01; mom: 7.755e-03;
## best it: 210; best obj: 2.311e+00
## It: 211; obj: 2.311e+00; abs: 1.952e-06; rel: 8.447e-07; norm: 1.097e-01; mom: 7.472e-03;
## best it: 211; best obj: 2.311e+00
## It: 212; obj: 2.311e+00; abs: 1.825e-06; rel: 7.896e-07; norm: 1.097e-01; mom: 7.202e-03;
## best it: 212; best obj: 2.311e+00
## It: 213; obj: 2.311e+00; abs: 1.707e-06; rel: 7.386e-07; norm: 1.097e-01; mom: 6.944e-03;
## best it: 213; best obj: 2.311e+00
## It: 214; obj: 2.311e+00; abs: 1.598e-06; rel: 6.914e-07; norm: 1.097e-01; mom: 6.700e-03;
## best it: 214; best obj: 2.311e+00
## It: 215; obj: 2.311e+00; abs: 1.497e-06; rel: 6.477e-07; norm: 1.097e-01; mom: 6.469e-03;
## best it: 215; best obj: 2.311e+00
## It: 216; obj: 2.311e+00; abs: 1.404e-06; rel: 6.075e-07; norm: 1.098e-01; mom: 6.252e-03;

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## best it: 216; best obj: 2.311e+00
## It: 217; obj: 2.311e+00; abs: 1.318e-06; rel: 5.703e-07; norm: 1.098e-01; mom: 6.049e-03;
## best it: 217; best obj: 2.311e+00
## It: 218; obj: 2.311e+00; abs: 1.239e-06; rel: 5.360e-07; norm: 1.098e-01; mom: 5.859e-03;
## best it: 218; best obj: 2.311e+00
## It: 219; obj: 2.311e+00; abs: 1.166e-06; rel: 5.044e-07; norm: 1.098e-01; mom: 5.683e-03;
## best it: 219; best obj: 2.311e+00
## It: 220; obj: 2.311e+00; abs: 1.098e-06; rel: 4.752e-07; norm: 1.098e-01; mom: 5.521e-03;
## best it: 220; best obj: 2.311e+00
## It: 221; obj: 2.311e+00; abs: 1.036e-06; rel: 4.484e-07; norm: 1.098e-01; mom: 5.371e-03;
## best it: 221; best obj: 2.311e+00
## It: 222; obj: 2.311e+00; abs: 9.792e-07; rel: 4.236e-07; norm: 1.098e-01; mom: 5.233e-03;
## best it: 222; best obj: 2.311e+00
## It: 223; obj: 2.311e+00; abs: 9.265e-07; rel: 4.008e-07; norm: 1.098e-01; mom: 5.106e-03;
## best it: 223; best obj: 2.311e+00
## It: 224; obj: 2.311e+00; abs: 8.780e-07; rel: 3.799e-07; norm: 1.098e-01; mom: 4.990e-03;
## best it: 224; best obj: 2.311e+00
## It: 225; obj: 2.311e+00; abs: 8.333e-07; rel: 3.605e-07; norm: 1.098e-01; mom: 4.883e-03;
## best it: 225; best obj: 2.311e+00

## It: 226; obj: 2.311e+00; abs: 7.922e-07; rel: 3.427e-07; norm: 1.098e-01; mom: 4.785e-03;
## best it: 226; best obj: 2.311e+00
## It: 227; obj: 2.311e+00; abs: 7.542e-07; rel: 3.263e-07; norm: 1.098e-01; mom: 4.694e-03;
## best it: 227; best obj: 2.311e+00
## It: 228; obj: 2.311e+00; abs: 7.192e-07; rel: 3.111e-07; norm: 1.098e-01; mom: 4.611e-03;
## best it: 228; best obj: 2.311e+00
## It: 229; obj: 2.311e+00; abs: 6.869e-07; rel: 2.972e-07; norm: 1.098e-01; mom: 4.534e-03;
## best it: 229; best obj: 2.311e+00
## It: 230; obj: 2.311e+00; abs: 6.570e-07; rel: 2.842e-07; norm: 1.098e-01; mom: 4.462e-03;
## best it: 230; best obj: 2.311e+00
## It: 231; obj: 2.311e+00; abs: 6.294e-07; rel: 2.723e-07; norm: 1.098e-01; mom: 4.395e-03;
## best it: 231; best obj: 2.311e+00
## It: 232; obj: 2.311e+00; abs: 6.038e-07; rel: 2.612e-07; norm: 1.098e-01; mom: 4.332e-03;
## best it: 232; best obj: 2.311e+00
## It: 233; obj: 2.311e+00; abs: 5.802e-07; rel: 2.510e-07; norm: 1.098e-01; mom: 4.272e-03;
## best it: 233; best obj: 2.311e+00
## It: 234; obj: 2.311e+00; abs: 5.582e-07; rel: 2.415e-07; norm: 1.098e-01; mom: 4.216e-03;
## best it: 234; best obj: 2.311e+00
## It: 235; obj: 2.311e+00; abs: 5.378e-07; rel: 2.327e-07; norm: 1.098e-01; mom: 4.163e-03;
## best it: 235; best obj: 2.311e+00
## It: 236; obj: 2.311e+00; abs: 5.187e-07; rel: 2.244e-07; norm: 1.098e-01; mom: 4.113e-03;
## best it: 236; best obj: 2.311e+00
## It: 237; obj: 2.311e+00; abs: 5.010e-07; rel: 2.168e-07; norm: 1.098e-01; mom: 4.064e-03;
## best it: 237; best obj: 2.311e+00
## It: 238; obj: 2.311e+00; abs: 4.844e-07; rel: 2.096e-07; norm: 1.098e-01; mom: 4.018e-03;
## best it: 238; best obj: 2.311e+00
## It: 239; obj: 2.311e+00; abs: 4.689e-07; rel: 2.029e-07; norm: 1.098e-01; mom: 3.973e-03;
## best it: 239; best obj: 2.311e+00
## It: 240; obj: 2.311e+00; abs: 4.543e-07; rel: 1.966e-07; norm: 1.098e-01; mom: 3.930e-03;
## best it: 240; best obj: 2.311e+00
## It: 241; obj: 2.311e+00; abs: 4.406e-07; rel: 1.906e-07; norm: 1.098e-01; mom: 3.888e-03;
## best it: 241; best obj: 2.311e+00
## It: 242; obj: 2.311e+00; abs: 4.276e-07; rel: 1.850e-07; norm: 1.098e-01; mom: 3.847e-03;
## best it: 242; best obj: 2.311e+00

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## It: 243; obj: 2.311e+00; abs: 4.154e-07; rel: 1.797e-07; norm: 1.098e-01; mom: 3.807e-03;
## best it: 243; best obj: 2.311e+00
## It: 244; obj: 2.311e+00; abs: 4.038e-07; rel: 1.747e-07; norm: 1.098e-01; mom: 3.767e-03;
## best it: 244; best obj: 2.311e+00
## It: 245; obj: 2.311e+00; abs: 3.927e-07; rel: 1.699e-07; norm: 1.098e-01; mom: 3.729e-03;
## best it: 245; best obj: 2.311e+00
## It: 246; obj: 2.311e+00; abs: 3.822e-07; rel: 1.654e-07; norm: 1.098e-01; mom: 3.690e-03;
## best it: 246; best obj: 2.311e+00
## It: 247; obj: 2.311e+00; abs: 3.721e-07; rel: 1.610e-07; norm: 1.098e-01; mom: 3.653e-03;
## best it: 247; best obj: 2.311e+00
## It: 248; obj: 2.311e+00; abs: 4.222e-07; rel: 1.826e-07; norm: 1.098e-01; mom: 5.784e-03;
## best it: 248; best obj: 2.311e+00
## It: 249; obj: 2.311e+00; abs: 4.379e-07; rel: 1.895e-07; norm: 1.098e-01; mom: 6.783e-03;
## best it: 249; best obj: 2.311e+00
## It: 250; obj: 2.311e+00; abs: 4.389e-07; rel: 1.899e-07; norm: 1.098e-01; mom: 7.206e-03;
## best it: 250; best obj: 2.311e+00

## It: 251; obj: 2.311e+00; abs: 4.314e-07; rel: 1.866e-07; norm: 1.098e-01; mom: 7.317e-03;
## best it: 251; best obj: 2.311e+00
## It: 252; obj: 2.311e+00; abs: 4.195e-07; rel: 1.815e-07; norm: 1.098e-01; mom: 7.288e-03;
## best it: 252; best obj: 2.311e+00
## It: 253; obj: 2.311e+00; abs: 4.064e-07; rel: 1.758e-07; norm: 1.098e-01; mom: 7.209e-03;
## best it: 253; best obj: 2.311e+00
## It: 254; obj: 2.311e+00; abs: 3.933e-07; rel: 1.701e-07; norm: 1.098e-01; mom: 7.114e-03;
## best it: 254; best obj: 2.311e+00
## It: 255; obj: 2.311e+00; abs: 3.805e-07; rel: 1.646e-07; norm: 1.098e-01; mom: 7.007e-03;
## best it: 255; best obj: 2.311e+00
## It: 256; obj: 2.311e+00; abs: 3.678e-07; rel: 1.591e-07; norm: 1.098e-01; mom: 6.893e-03;
## best it: 256; best obj: 2.311e+00
## It: 257; obj: 2.311e+00; abs: 3.555e-07; rel: 1.538e-07; norm: 1.098e-01; mom: 6.777e-03;
## best it: 257; best obj: 2.311e+00
## It: 258; obj: 2.311e+00; abs: 3.436e-07; rel: 1.487e-07; norm: 1.098e-01; mom: 6.663e-03;
## best it: 258; best obj: 2.311e+00
## It: 259; obj: 2.311e+00; abs: 3.321e-07; rel: 1.437e-07; norm: 1.098e-01; mom: 6.549e-03;
## best it: 259; best obj: 2.311e+00
## It: 260; obj: 2.311e+00; abs: 3.208e-07; rel: 1.388e-07; norm: 1.098e-01; mom: 6.436e-03;
## best it: 260; best obj: 2.311e+00
## It: 261; obj: 2.311e+00; abs: 3.098e-07; rel: 1.340e-07; norm: 1.098e-01; mom: 6.323e-03;
## best it: 261; best obj: 2.311e+00
## It: 262; obj: 2.311e+00; abs: 2.991e-07; rel: 1.294e-07; norm: 1.098e-01; mom: 6.211e-03;
## best it: 262; best obj: 2.311e+00
## It: 263; obj: 2.311e+00; abs: 2.885e-07; rel: 1.248e-07; norm: 1.098e-01; mom: 6.100e-03;
## best it: 263; best obj: 2.311e+00
## It: 264; obj: 2.311e+00; abs: 2.782e-07; rel: 1.204e-07; norm: 1.098e-01; mom: 5.992e-03;
## best it: 264; best obj: 2.311e+00
## It: 265; obj: 2.311e+00; abs: 2.685e-07; rel: 1.161e-07; norm: 1.098e-01; mom: 5.883e-03;
## best it: 265; best obj: 2.311e+00
## It: 266; obj: 2.311e+00; abs: 2.589e-07; rel: 1.120e-07; norm: 1.098e-01; mom: 5.772e-03;
## best it: 266; best obj: 2.311e+00
## It: 267; obj: 2.311e+00; abs: 2.489e-07; rel: 1.077e-07; norm: 1.098e-01; mom: 5.662e-03;
## best it: 267; best obj: 2.311e+00
## It: 268; obj: 2.311e+00; abs: 2.395e-07; rel: 1.036e-07; norm: 1.098e-01; mom: 5.553e-03;
## best it: 268; best obj: 2.311e+00
## It: 269; obj: 2.311e+00; abs: 2.314e-07; rel: 1.001e-07; norm: 1.098e-01; mom: 5.445e-03;

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## best it: 269; best obj: 2.311e+00
## It: 270; obj: 2.311e+00; abs: 2.220e-07; rel: 9.605e-08; norm: 1.098e-01; mom: 5.338e-03;
## best it: 270; best obj: 2.311e+00
## It: 271; obj: 2.311e+00; abs: 2.117e-07; rel: 9.158e-08; norm: 1.098e-01; mom: 5.233e-03;
## best it: 271; best obj: 2.311e+00
## It: 272; obj: 2.311e+00; abs: 2.052e-07; rel: 8.878e-08; norm: 1.098e-01; mom: 5.129e-03;
## best it: 272; best obj: 2.311e+00
## It: 273; obj: 2.311e+00; abs: 1.992e-07; rel: 8.618e-08; norm: 1.098e-01; mom: 5.024e-03;
## best it: 273; best obj: 2.311e+00
## It: 274; obj: 2.311e+00; abs: 1.862e-07; rel: 8.057e-08; norm: 1.098e-01; mom: 4.922e-03;
## best it: 274; best obj: 2.311e+00
## It: 275; obj: 2.311e+00; abs: 1.766e-07; rel: 7.640e-08; norm: 1.098e-01; mom: 4.823e-03;
## best it: 275; best obj: 2.311e+00

## It: 276; obj: 2.311e+00; abs: 1.788e-07; rel: 7.735e-08; norm: 1.098e-01; mom: 4.716e-03;
## best it: 276; best obj: 2.311e+00
## It: 277; obj: 2.311e+00; abs: 1.686e-07; rel: 7.296e-08; norm: 1.098e-01; mom: 4.614e-03;
## best it: 277; best obj: 2.311e+00
## It: 278; obj: 2.311e+00; abs: 1.427e-07; rel: 6.174e-08; norm: 1.098e-01; mom: 4.536e-03;
## best it: 278; best obj: 2.311e+00
## It: 279; obj: 2.311e+00; abs: 1.487e-07; rel: 6.432e-08; norm: 1.098e-01; mom: 4.448e-03;
## best it: 279; best obj: 2.311e+00
## It: 280; obj: 2.311e+00; abs: 1.674e-07; rel: 7.244e-08; norm: 1.098e-01; mom: 4.323e-03;
## best it: 280; best obj: 2.311e+00
## It: 281; obj: 2.311e+00; abs: 1.178e-07; rel: 5.094e-08; norm: 1.098e-01; mom: 4.264e-03;
## best it: 281; best obj: 2.311e+00
## It: 282; obj: 2.311e+00; abs: 7.915e-08; rel: 3.425e-08; norm: 1.098e-01; mom: 4.808e-03;
## best it: 282; best obj: 2.311e+00
## It: 283; obj: 2.311e+00; abs: 1.614e-07; rel: 6.985e-08; norm: 1.098e-01; mom: 4.161e-03;
## best it: 283; best obj: 2.311e+00
## It: 284; obj: 2.311e+00; abs: 1.562e-07; rel: 6.757e-08; norm: 1.098e-01; mom: 3.959e-03;
## best it: 284; best obj: 2.311e+00
## It: 285; obj: 2.311e+00; abs: 3.762e-08; rel: 1.627e-08; norm: 1.098e-01; mom: 6.588e-03;
## best it: 284; best obj: 2.311e+00
## It: 286; obj: 2.311e+00; abs: 2.594e-08; rel: 1.122e-08; norm: 1.098e-01; mom: 7.985e-03;
## best it: 284; best obj: 2.311e+00
## It: 287; obj: 2.311e+00; abs: 3.044e-07; rel: 1.317e-07; norm: 1.098e-01; mom: 3.869e-03;
## best it: 287; best obj: 2.311e+00
## It: 288; obj: 2.311e+00; abs: 4.437e-08; rel: 1.920e-08; norm: 1.098e-01; mom: 6.952e-03;
## best it: 287; best obj: 2.311e+00
## It: 289; obj: 2.311e+00; abs: 4.719e-07; rel: 2.042e-07; norm: 1.098e-01; mom: 1.389e-02;
## best it: 287; best obj: 2.311e+00
## It: 290; obj: 2.311e+00; abs: 2.857e-07; rel: 1.236e-07; norm: 1.097e-01; mom: 1.160e-02;
## best it: 287; best obj: 2.311e+00
## It: 291; obj: 2.311e+00; abs: 5.524e-07; rel: 2.390e-07; norm: 1.098e-01; mom: 3.936e-03;
## best it: 291; best obj: 2.311e+00
## It: 292; obj: 2.311e+00; abs: 1.216e-06; rel: 5.261e-07; norm: 1.098e-01; mom: 1.853e-02;
## best it: 291; best obj: 2.311e+00
## It: 293; obj: 2.311e+00; abs: 1.134e-06; rel: 4.908e-07; norm: 1.098e-01; mom: 2.511e-02;
## best it: 291; best obj: 2.311e+00
## It: 294; obj: 2.311e+00; abs: 1.865e-06; rel: 8.068e-07; norm: 1.098e-01; mom: 1.318e-02;
## best it: 291; best obj: 2.311e+00
## It: 295; obj: 2.311e+00; abs: 6.130e-07; rel: 2.652e-07; norm: 1.098e-01; mom: 1.783e-02;
## best it: 291; best obj: 2.311e+00

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## It: 296; obj: 2.311e+00; abs: 5.524e-06; rel: 2.390e-06; norm: 1.097e-01; mom: 4.233e-02;
## best it: 291; best obj: 2.311e+00
## It: 297; obj: 2.311e+00; abs: 4.740e-07; rel: 2.051e-07; norm: 1.097e-01; mom: 3.901e-02;
## best it: 291; best obj: 2.311e+00
## It: 298; obj: 2.311e+00; abs: 5.643e-06; rel: 2.441e-06; norm: 1.097e-01; mom: 9.953e-03;
## best it: 291; best obj: 2.311e+00
## It: 299; obj: 2.311e+00; abs: 9.110e-06; rel: 3.941e-06; norm: 1.098e-01; mom: 5.025e-02;
## best it: 291; best obj: 2.311e+00
## It: 300; obj: 2.311e+00; abs: 1.583e-05; rel: 6.850e-06; norm: 1.098e-01; mom: 7.790e-02;
## best it: 291; best obj: 2.311e+00

## It: 301; obj: 2.311e+00; abs: 1.265e-05; rel: 5.471e-06; norm: 1.098e-01; mom: 5.385e-02;
## best it: 291; best obj: 2.311e+00
## It: 302; obj: 2.311e+00; abs: 4.625e-06; rel: 2.001e-06; norm: 1.098e-01; mom: 3.620e-02;
## best it: 291; best obj: 2.311e+00
## It: 303; obj: 2.311e+00; abs: 5.021e-05; rel: 2.172e-05; norm: 1.097e-01; mom: 1.288e-01;
## best it: 291; best obj: 2.311e+00
## It: 304; obj: 2.311e+00; abs: 2.352e-05; rel: 1.018e-05; norm: 1.097e-01; mom: 1.347e-01;
## best it: 291; best obj: 2.311e+00
## It: 305; obj: 2.311e+00; abs: 4.983e-05; rel: 2.156e-05; norm: 1.097e-01; mom: 5.569e-02;
## best it: 291; best obj: 2.311e+00
## It: 306; obj: 2.311e+00; abs: 5.132e-06; rel: 2.220e-06; norm: 1.097e-01; mom: 9.347e-02;
## best it: 291; best obj: 2.311e+00
## It: 307; obj: 2.312e+00; abs: 1.340e-04; rel: 5.796e-05; norm: 1.098e-01; mom: 2.146e-01;
## best it: 291; best obj: 2.311e+00
## It: 308; obj: 2.312e+00; abs: 1.611e-04; rel: 6.970e-05; norm: 1.098e-01; mom: 2.306e-01;
## best it: 291; best obj: 2.311e+00
## It: 309; obj: 2.312e+00; abs: 1.752e-04; rel: 7.578e-05; norm: 1.098e-01; mom: 2.328e-01;
## best it: 291; best obj: 2.311e+00
## It: 310; obj: 2.312e+00; abs: 5.039e-04; rel: 2.180e-04; norm: 1.097e-01; mom: 4.377e-01;
## best it: 291; best obj: 2.311e+00
## It: 311; obj: 2.313e+00; abs: 5.490e-04; rel: 2.374e-04; norm: 1.096e-01; mom: 4.392e-01;
## best it: 291; best obj: 2.311e+00
## It: 312; obj: 2.314e+00; abs: 5.796e-04; rel: 2.506e-04; norm: 1.097e-01; mom: 6.333e-01;
## best it: 291; best obj: 2.311e+00
## It: 313; obj: 2.313e+00; abs: 8.382e-04; rel: 3.623e-04; norm: 1.098e-01; mom: 1.041e+00;
## best it: 291; best obj: 2.311e+00
## It: 314; obj: 2.311e+00; abs: 1.258e-03; rel: 5.440e-04; norm: 1.096e-01; mom: 8.595e-01;
## best it: 291; best obj: 2.311e+00
## It: 315; obj: 2.312e+00; abs: 3.042e-04; rel: 1.316e-04; norm: 1.098e-01; mom: 8.907e-01;
## best it: 291; best obj: 2.311e+00
## It: 316; obj: 2.312e+00; abs: 3.928e-04; rel: 1.699e-04; norm: 1.098e-01; mom: 4.902e-01;
## best it: 291; best obj: 2.311e+00
## It: 317; obj: 2.313e+00; abs: 5.939e-04; rel: 2.569e-04; norm: 1.097e-01; mom: 6.774e-01;
## best it: 291; best obj: 2.311e+00
## It: 318; obj: 2.313e+00; abs: 5.471e-04; rel: 2.365e-04; norm: 1.096e-01; mom: 4.704e-01;
## best it: 291; best obj: 2.311e+00
## It: 319; obj: 2.314e+00; abs: 3.391e-04; rel: 1.466e-04; norm: 1.098e-01; mom: 1.146e+00;
## best it: 291; best obj: 2.311e+00
## It: 320; obj: 2.312e+00; abs: 2.080e-03; rel: 8.989e-04; norm: 1.098e-01; mom: 5.037e-01;
## best it: 291; best obj: 2.311e+00
## It: 321; obj: 2.312e+00; abs: 1.499e-04; rel: 6.484e-05; norm: 1.098e-01; mom: 1.427e+00;
## best it: 291; best obj: 2.311e+00
## It: 322; obj: 2.312e+00; abs: 1.824e-04; rel: 7.890e-05; norm: 1.098e-01; mom: 2.591e-01;

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## best it: 291; best obj: 2.311e+00
## It: 323; obj: 2.312e+00; abs: 5.313e-04; rel: 2.298e-04; norm: 1.097e-01; mom: 4.455e-01;
## best it: 291; best obj: 2.311e+00
## It: 324; obj: 2.313e+00; abs: 5.490e-04; rel: 2.374e-04; norm: 1.096e-01; mom: 4.833e-01;
## best it: 291; best obj: 2.311e+00
## It: 325; obj: 2.314e+00; abs: 5.745e-04; rel: 2.484e-04; norm: 1.097e-01; mom: 6.267e-01;
## best it: 291; best obj: 2.311e+00

## It: 326; obj: 2.313e+00; abs: 7.384e-04; rel: 3.192e-04; norm: 1.098e-01; mom: 1.048e+00;
## best it: 291; best obj: 2.311e+00
## It: 327; obj: 2.311e+00; abs: 1.328e-03; rel: 5.741e-04; norm: 1.097e-01; mom: 8.417e-01;
## best it: 291; best obj: 2.311e+00
## It: 328; obj: 2.312e+00; abs: 2.843e-04; rel: 1.230e-04; norm: 1.098e-01; mom: 9.286e-01;
## best it: 291; best obj: 2.311e+00
## It: 329; obj: 2.312e+00; abs: 4.007e-04; rel: 1.733e-04; norm: 1.098e-01; mom: 4.840e-01;
## best it: 291; best obj: 2.311e+00
## It: 330; obj: 2.313e+00; abs: 6.094e-04; rel: 2.636e-04; norm: 1.096e-01; mom: 6.776e-01;
## best it: 291; best obj: 2.311e+00
## It: 331; obj: 2.313e+00; abs: 5.502e-04; rel: 2.379e-04; norm: 1.096e-01; mom: 4.721e-01;
## best it: 291; best obj: 2.311e+00
## It: 332; obj: 2.314e+00; abs: 3.052e-04; rel: 1.319e-04; norm: 1.098e-01; mom: 1.148e+00;
## best it: 291; best obj: 2.311e+00
## It: 333; obj: 2.312e+00; abs: 2.054e-03; rel: 8.878e-04; norm: 1.098e-01; mom: 5.125e-01;
## best it: 291; best obj: 2.311e+00
## It: 334; obj: 2.312e+00; abs: 1.584e-04; rel: 6.853e-05; norm: 1.098e-01; mom: 1.421e+00;
## best it: 291; best obj: 2.311e+00
## It: 335; obj: 2.312e+00; abs: 1.719e-04; rel: 7.435e-05; norm: 1.098e-01; mom: 2.627e-01;
## best it: 291; best obj: 2.311e+00
## It: 336; obj: 2.312e+00; abs: 5.467e-04; rel: 2.365e-04; norm: 1.097e-01; mom: 4.736e-01;
## best it: 291; best obj: 2.311e+00
## It: 337; obj: 2.313e+00; abs: 5.611e-04; rel: 2.427e-04; norm: 1.096e-01; mom: 4.648e-01;
## best it: 291; best obj: 2.311e+00
## It: 338; obj: 2.314e+00; abs: 5.487e-04; rel: 2.372e-04; norm: 1.096e-01; mom: 6.728e-01;
## best it: 291; best obj: 2.311e+00
## It: 339; obj: 2.313e+00; abs: 9.741e-04; rel: 4.210e-04; norm: 1.098e-01; mom: 1.001e+00;
## best it: 291; best obj: 2.311e+00
## It: 340; obj: 2.311e+00; abs: 1.106e-03; rel: 4.784e-04; norm: 1.096e-01; mom: 9.022e-01;
## best it: 291; best obj: 2.311e+00
## It: 341; obj: 2.312e+00; abs: 2.945e-04; rel: 1.274e-04; norm: 1.098e-01; mom: 8.236e-01;
## best it: 291; best obj: 2.311e+00
## It: 342; obj: 2.312e+00; abs: 3.525e-04; rel: 1.525e-04; norm: 1.098e-01; mom: 5.023e-01;
## best it: 291; best obj: 2.311e+00
## It: 343; obj: 2.313e+00; abs: 6.146e-04; rel: 2.658e-04; norm: 1.097e-01; mom: 6.773e-01;
## best it: 291; best obj: 2.311e+00
## It: 344; obj: 2.313e+00; abs: 5.426e-04; rel: 2.346e-04; norm: 1.096e-01; mom: 4.656e-01;
## best it: 291; best obj: 2.311e+00
## It: 345; obj: 2.314e+00; abs: 3.612e-04; rel: 1.561e-04; norm: 1.097e-01; mom: 1.136e+00;
## best it: 291; best obj: 2.311e+00
## It: 346; obj: 2.312e+00; abs: 2.106e-03; rel: 9.102e-04; norm: 1.098e-01; mom: 4.875e-01;
## best it: 291; best obj: 2.311e+00
## It: 347; obj: 2.312e+00; abs: 1.710e-04; rel: 7.399e-05; norm: 1.098e-01; mom: 1.442e+00;
## best it: 291; best obj: 2.311e+00
## It: 348; obj: 2.312e+00; abs: 1.592e-04; rel: 6.887e-05; norm: 1.098e-01; mom: 2.531e-01;
## best it: 291; best obj: 2.311e+00

```

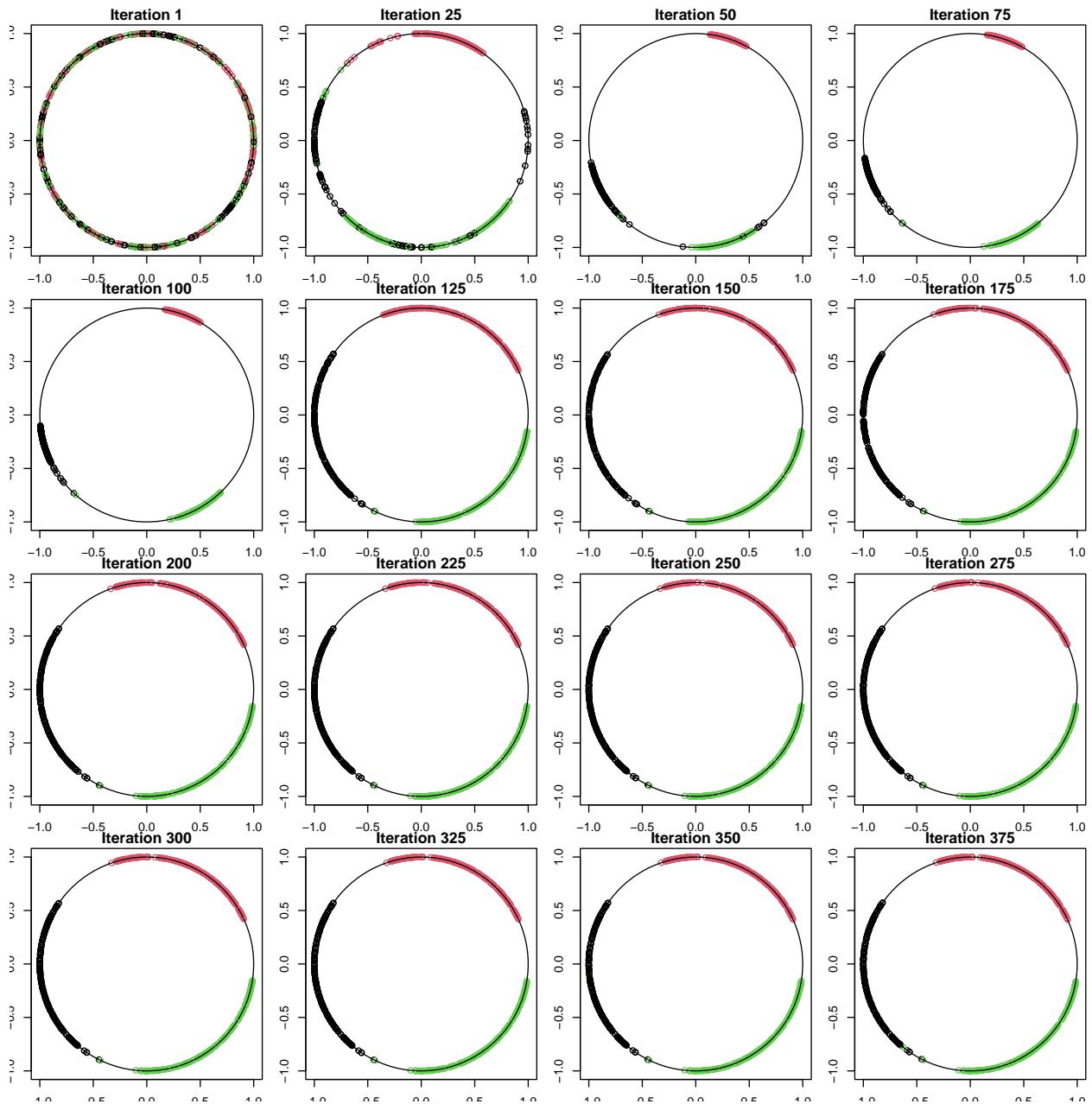
```

## It: 349; obj: 2.312e+00; abs: 4.870e-04; rel: 2.107e-04; norm: 1.097e-01; mom: 3.951e-01;
## best it: 291; best obj: 2.311e+00
## It: 350; obj: 2.313e+00; abs: 5.810e-04; rel: 2.513e-04; norm: 1.096e-01; mom: 5.276e-01;
## best it: 291; best obj: 2.311e+00

## It: 351; obj: 2.314e+00; abs: 6.103e-04; rel: 2.639e-04; norm: 1.096e-01; mom: 5.715e-01;
## best it: 291; best obj: 2.311e+00
## It: 352; obj: 2.313e+00; abs: 4.564e-04; rel: 1.973e-04; norm: 1.098e-01; mom: 1.101e+00;
## best it: 291; best obj: 2.311e+00
## It: 353; obj: 2.311e+00; abs: 1.590e-03; rel: 6.875e-04; norm: 1.097e-01; mom: 7.569e-01;
## best it: 291; best obj: 2.311e+00
## It: 354; obj: 2.312e+00; abs: 2.941e-04; rel: 1.272e-04; norm: 1.098e-01; mom: 1.087e+00;
## best it: 291; best obj: 2.311e+00
## It: 355; obj: 2.312e+00; abs: 4.117e-04; rel: 1.781e-04; norm: 1.098e-01; mom: 4.412e-01;
## best it: 291; best obj: 2.311e+00
## It: 356; obj: 2.313e+00; abs: 5.840e-04; rel: 2.526e-04; norm: 1.097e-01; mom: 6.761e-01;
## best it: 291; best obj: 2.311e+00
## It: 357; obj: 2.313e+00; abs: 6.080e-04; rel: 2.629e-04; norm: 1.096e-01; mom: 4.860e-01;
## best it: 291; best obj: 2.311e+00
## It: 358; obj: 2.314e+00; abs: 2.047e-04; rel: 8.848e-05; norm: 1.097e-01; mom: 1.156e+00;
## best it: 291; best obj: 2.311e+00
## It: 359; obj: 2.312e+00; abs: 2.035e-03; rel: 8.794e-04; norm: 1.097e-01; mom: 5.542e-01;
## best it: 291; best obj: 2.311e+00
## It: 360; obj: 2.312e+00; abs: 1.827e-04; rel: 7.905e-05; norm: 1.098e-01; mom: 1.380e+00;
## best it: 291; best obj: 2.311e+00
## It: 361; obj: 2.312e+00; abs: 2.705e-04; rel: 1.170e-04; norm: 1.098e-01; mom: 3.017e-01;
## best it: 291; best obj: 2.311e+00
## It: 362; obj: 2.313e+00; abs: 5.604e-04; rel: 2.424e-04; norm: 1.097e-01; mom: 5.587e-01;
## best it: 291; best obj: 2.311e+00
## It: 363; obj: 2.313e+00; abs: 4.215e-04; rel: 1.823e-04; norm: 1.096e-01; mom: 4.321e-01;
## best it: 291; best obj: 2.311e+00
## It: 364; obj: 2.314e+00; abs: 5.480e-04; rel: 2.369e-04; norm: 1.097e-01; mom: 9.634e-01;
## best it: 291; best obj: 2.311e+00
## It: 365; obj: 2.312e+00; abs: 1.917e-03; rel: 8.286e-04; norm: 1.097e-01; mom: 6.164e-01;
## best it: 291; best obj: 2.311e+00
## It: 366; obj: 2.311e+00; abs: 1.599e-04; rel: 6.919e-05; norm: 1.097e-01; mom: 1.282e+00;
## best it: 291; best obj: 2.311e+00
## It: 367; obj: 2.312e+00; abs: 2.764e-04; rel: 1.196e-04; norm: 1.098e-01; mom: 4.217e-01;
## best it: 291; best obj: 2.311e+00
## It: 368; obj: 2.312e+00; abs: 3.600e-04; rel: 1.557e-04; norm: 1.098e-01; mom: 4.301e-01;
## best it: 291; best obj: 2.311e+00
## It: 369; obj: 2.313e+00; abs: 5.901e-04; rel: 2.552e-04; norm: 1.097e-01; mom: 6.555e-01;
## best it: 291; best obj: 2.311e+00
## It: 370; obj: 2.313e+00; abs: 4.952e-04; rel: 2.141e-04; norm: 1.096e-01; mom: 4.570e-01;
## best it: 291; best obj: 2.311e+00
## It: 371; obj: 2.314e+00; abs: 4.409e-04; rel: 1.906e-04; norm: 1.097e-01; mom: 1.122e+00;
## best it: 291; best obj: 2.311e+00
## It: 372; obj: 2.311e+00; abs: 2.129e-03; rel: 9.203e-04; norm: 1.098e-01; mom: 4.741e-01;
## best it: 291; best obj: 2.311e+00
## It: 373; obj: 2.312e+00; abs: 1.422e-04; rel: 6.152e-05; norm: 1.098e-01; mom: 1.450e+00;
## best it: 291; best obj: 2.311e+00
## It: 374; obj: 2.312e+00; abs: 1.693e-04; rel: 7.322e-05; norm: 1.098e-01; mom: 2.391e-01;
## best it: 291; best obj: 2.311e+00
## It: 375; obj: 2.312e+00; abs: 4.354e-04; rel: 1.883e-04; norm: 1.097e-01; mom: 3.276e-01;

```

```
## best it: 291; best obj: 2.311e+00
```



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## It: 376; obj: 2.313e+00; abs: 5.711e-04; rel: 2.470e-04; norm: 1.096e-01; mom: 5.698e-01;  
## best it: 291; best obj: 2.311e+00  
## It: 377; obj: 2.313e+00; abs: 6.273e-04; rel: 2.712e-04; norm: 1.096e-01; mom: 4.914e-01;  
## best it: 291; best obj: 2.311e+00  
## It: 378; obj: 2.313e+00; abs: 1.795e-05; rel: 7.760e-06; norm: 1.098e-01; mom: 1.161e+00;  
## best it: 291; best obj: 2.311e+00  
## It: 379; obj: 2.312e+00; abs: 1.913e-03; rel: 8.267e-04; norm: 1.097e-01; mom: 6.142e-01;  
## best it: 291; best obj: 2.311e+00  
## It: 380; obj: 2.312e+00; abs: 2.074e-04; rel: 8.972e-05; norm: 1.098e-01; mom: 1.306e+00;  
## best it: 291; best obj: 2.311e+00  
## It: 381; obj: 2.312e+00; abs: 3.600e-04; rel: 1.557e-04; norm: 1.098e-01; mom: 3.424e-01;  
## best it: 291; best obj: 2.311e+00
```

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## It: 382; obj: 2.313e+00; abs: 5.863e-04; rel: 2.536e-04; norm: 1.096e-01; mom: 6.204e-01;
## best it: 291; best obj: 2.311e+00
## It: 383; obj: 2.313e+00; abs: 5.344e-04; rel: 2.311e-04; norm: 1.096e-01; mom: 4.522e-01;
## best it: 291; best obj: 2.311e+00
## It: 384; obj: 2.314e+00; abs: 3.926e-04; rel: 1.697e-04; norm: 1.097e-01; mom: 1.140e+00;
## best it: 291; best obj: 2.311e+00
## It: 385; obj: 2.312e+00; abs: 2.111e-03; rel: 9.125e-04; norm: 1.098e-01; mom: 4.803e-01;
## best it: 291; best obj: 2.311e+00
## It: 386; obj: 2.312e+00; abs: 1.479e-04; rel: 6.396e-05; norm: 1.098e-01; mom: 1.445e+00;
## best it: 291; best obj: 2.311e+00
## It: 387; obj: 2.312e+00; abs: 1.683e-04; rel: 7.282e-05; norm: 1.098e-01; mom: 2.427e-01;
## best it: 291; best obj: 2.311e+00
## It: 388; obj: 2.312e+00; abs: 4.834e-04; rel: 2.091e-04; norm: 1.097e-01; mom: 3.727e-01;
## best it: 291; best obj: 2.311e+00
## It: 389; obj: 2.313e+00; abs: 5.652e-04; rel: 2.444e-04; norm: 1.096e-01; mom: 5.367e-01;
## best it: 291; best obj: 2.311e+00
## It: 390; obj: 2.313e+00; abs: 6.178e-04; rel: 2.671e-04; norm: 1.096e-01; mom: 5.421e-01;
## best it: 291; best obj: 2.311e+00
## It: 391; obj: 2.313e+00; abs: 2.930e-04; rel: 1.266e-04; norm: 1.098e-01; mom: 1.125e+00;
## best it: 291; best obj: 2.311e+00
## It: 392; obj: 2.311e+00; abs: 1.703e-03; rel: 7.361e-04; norm: 1.097e-01; mom: 7.143e-01;
## best it: 291; best obj: 2.311e+00
## It: 393; obj: 2.312e+00; abs: 2.560e-04; rel: 1.107e-04; norm: 1.098e-01; mom: 1.156e+00;
## best it: 291; best obj: 2.311e+00
## It: 394; obj: 2.312e+00; abs: 4.240e-04; rel: 1.834e-04; norm: 1.098e-01; mom: 4.141e-01;
## best it: 291; best obj: 2.311e+00
## It: 395; obj: 2.313e+00; abs: 5.925e-04; rel: 2.562e-04; norm: 1.096e-01; mom: 6.628e-01;
## best it: 291; best obj: 2.311e+00
## It: 396; obj: 2.313e+00; abs: 5.853e-04; rel: 2.531e-04; norm: 1.096e-01; mom: 4.809e-01;
## best it: 291; best obj: 2.311e+00
## It: 397; obj: 2.314e+00; abs: 2.216e-04; rel: 9.579e-05; norm: 1.098e-01; mom: 1.156e+00;
## best it: 291; best obj: 2.311e+00
## It: 398; obj: 2.312e+00; abs: 2.018e-03; rel: 8.723e-04; norm: 1.097e-01; mom: 5.475e-01;
## best it: 291; best obj: 2.311e+00
## It: 399; obj: 2.312e+00; abs: 1.653e-04; rel: 7.150e-05; norm: 1.098e-01; mom: 1.386e+00;
## best it: 291; best obj: 2.311e+00
## It: 400; obj: 2.312e+00; abs: 2.471e-04; rel: 1.069e-04; norm: 1.098e-01; mom: 2.911e-01;
## best it: 291; best obj: 2.311e+00

## It: 401; obj: 2.313e+00; abs: 5.726e-04; rel: 2.477e-04; norm: 1.096e-01; mom: 5.456e-01;
## best it: 291; best obj: 2.311e+00
## It: 402; obj: 2.313e+00; abs: 4.506e-04; rel: 1.948e-04; norm: 1.096e-01; mom: 4.316e-01;
## best it: 291; best obj: 2.311e+00
## It: 403; obj: 2.314e+00; abs: 5.297e-04; rel: 2.290e-04; norm: 1.097e-01; mom: 9.092e-01;
## best it: 291; best obj: 2.311e+00
## It: 404; obj: 2.312e+00; abs: 1.773e-03; rel: 7.665e-04; norm: 1.098e-01; mom: 6.944e-01;
## best it: 291; best obj: 2.311e+00
## It: 405; obj: 2.311e+00; abs: 2.928e-04; rel: 1.267e-04; norm: 1.097e-01; mom: 1.203e+00;
## best it: 291; best obj: 2.311e+00
## It: 406; obj: 2.312e+00; abs: 2.627e-04; rel: 1.136e-04; norm: 1.098e-01; mom: 4.742e-01;
## best it: 291; best obj: 2.311e+00
## It: 407; obj: 2.312e+00; abs: 3.281e-04; rel: 1.419e-04; norm: 1.098e-01; mom: 4.645e-01;
## best it: 291; best obj: 2.311e+00
## It: 408; obj: 2.313e+00; abs: 6.138e-04; rel: 2.655e-04; norm: 1.096e-01; mom: 6.543e-01;

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## best it: 291; best obj: 2.311e+00
## It: 409; obj: 2.313e+00; abs: 4.366e-04; rel: 1.888e-04; norm: 1.096e-01; mom: 4.537e-01;
## best it: 291; best obj: 2.311e+00
## It: 410; obj: 2.314e+00; abs: 4.820e-04; rel: 2.084e-04; norm: 1.097e-01; mom: 1.083e+00;
## best it: 291; best obj: 2.311e+00
## It: 411; obj: 2.311e+00; abs: 2.127e-03; rel: 9.193e-04; norm: 1.098e-01; mom: 4.823e-01;
## best it: 291; best obj: 2.311e+00
## It: 412; obj: 2.312e+00; abs: 1.409e-04; rel: 6.097e-05; norm: 1.098e-01; mom: 1.442e+00;
## best it: 291; best obj: 2.311e+00
## It: 413; obj: 2.312e+00; abs: 1.655e-04; rel: 7.158e-05; norm: 1.098e-01; mom: 2.555e-01;
## best it: 291; best obj: 2.311e+00
## It: 414; obj: 2.312e+00; abs: 3.334e-04; rel: 1.442e-04; norm: 1.097e-01; mom: 3.017e-01;
## best it: 291; best obj: 2.311e+00
## It: 415; obj: 2.313e+00; abs: 5.880e-04; rel: 2.543e-04; norm: 1.096e-01; mom: 5.749e-01;
## best it: 291; best obj: 2.311e+00
## It: 416; obj: 2.313e+00; abs: 4.964e-04; rel: 2.146e-04; norm: 1.096e-01; mom: 4.332e-01;
## best it: 291; best obj: 2.311e+00
## It: 417; obj: 2.314e+00; abs: 4.303e-04; rel: 1.860e-04; norm: 1.097e-01; mom: 1.127e+00;
## best it: 291; best obj: 2.311e+00
## It: 418; obj: 2.311e+00; abs: 2.109e-03; rel: 9.114e-04; norm: 1.098e-01; mom: 4.696e-01;
## best it: 291; best obj: 2.311e+00
## It: 419; obj: 2.312e+00; abs: 1.471e-04; rel: 6.365e-05; norm: 1.098e-01; mom: 1.455e+00;
## best it: 291; best obj: 2.311e+00
## It: 420; obj: 2.312e+00; abs: 1.449e-04; rel: 6.268e-05; norm: 1.098e-01; mom: 2.355e-01;
## best it: 291; best obj: 2.311e+00
## It: 421; obj: 2.312e+00; abs: 4.099e-04; rel: 1.773e-04; norm: 1.097e-01; mom: 3.155e-01;
## best it: 291; best obj: 2.311e+00
## It: 422; obj: 2.313e+00; abs: 5.887e-04; rel: 2.546e-04; norm: 1.096e-01; mom: 5.689e-01;
## best it: 291; best obj: 2.311e+00
## It: 423; obj: 2.313e+00; abs: 6.116e-04; rel: 2.645e-04; norm: 1.096e-01; mom: 4.657e-01;
## best it: 291; best obj: 2.311e+00
## It: 424; obj: 2.314e+00; abs: 1.468e-04; rel: 6.344e-05; norm: 1.097e-01; mom: 1.173e+00;
## best it: 291; best obj: 2.311e+00
## It: 425; obj: 2.312e+00; abs: 1.972e-03; rel: 8.525e-04; norm: 1.097e-01; mom: 5.603e-01;
## best it: 291; best obj: 2.311e+00
## It: 426; obj: 2.312e+00; abs: 1.824e-04; rel: 7.891e-05; norm: 1.098e-01; mom: 1.372e+00;
## best it: 291; best obj: 2.311e+00
## It: 427; obj: 2.312e+00; abs: 2.646e-04; rel: 1.145e-04; norm: 1.098e-01; mom: 3.028e-01;
## best it: 291; best obj: 2.311e+00
## It: 428; obj: 2.313e+00; abs: 5.830e-04; rel: 2.522e-04; norm: 1.096e-01; mom: 5.760e-01;
## best it: 291; best obj: 2.311e+00
## It: 429; obj: 2.313e+00; abs: 4.374e-04; rel: 1.891e-04; norm: 1.096e-01; mom: 4.317e-01;
## best it: 291; best obj: 2.311e+00
## It: 430; obj: 2.314e+00; abs: 5.127e-04; rel: 2.217e-04; norm: 1.097e-01; mom: 1.035e+00;
## best it: 291; best obj: 2.311e+00
## It: 431; obj: 2.311e+00; abs: 2.103e-03; rel: 9.090e-04; norm: 1.098e-01; mom: 5.240e-01;
## best it: 291; best obj: 2.311e+00
## It: 432; obj: 2.312e+00; abs: 8.125e-05; rel: 3.515e-05; norm: 1.097e-01; mom: 1.390e+00;
## best it: 291; best obj: 2.311e+00
## It: 433; obj: 2.312e+00; abs: 2.346e-04; rel: 1.015e-04; norm: 1.098e-01; mom: 3.351e-01;
## best it: 291; best obj: 2.311e+00
## It: 434; obj: 2.312e+00; abs: 3.473e-04; rel: 1.502e-04; norm: 1.098e-01; mom: 3.592e-01;
## best it: 291; best obj: 2.311e+00

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## It: 435; obj: 2.313e+00; abs: 6.010e-04; rel: 2.600e-04; norm: 1.096e-01; mom: 6.317e-01;
## best it: 291; best obj: 2.311e+00
## It: 436; obj: 2.313e+00; abs: 5.614e-04; rel: 2.427e-04; norm: 1.096e-01; mom: 4.573e-01;
## best it: 291; best obj: 2.311e+00
## It: 437; obj: 2.314e+00; abs: 3.531e-04; rel: 1.527e-04; norm: 1.097e-01; mom: 1.144e+00;
## best it: 291; best obj: 2.311e+00
## It: 438; obj: 2.312e+00; abs: 2.109e-03; rel: 9.117e-04; norm: 1.097e-01; mom: 4.874e-01;
## best it: 291; best obj: 2.311e+00
## It: 439; obj: 2.312e+00; abs: 1.721e-04; rel: 7.444e-05; norm: 1.098e-01; mom: 1.441e+00;
## best it: 291; best obj: 2.311e+00
## It: 440; obj: 2.312e+00; abs: 1.643e-04; rel: 7.106e-05; norm: 1.098e-01; mom: 2.561e-01;
## best it: 291; best obj: 2.311e+00
## It: 441; obj: 2.312e+00; abs: 4.884e-04; rel: 2.113e-04; norm: 1.097e-01; mom: 4.042e-01;
## best it: 291; best obj: 2.311e+00
## It: 442; obj: 2.313e+00; abs: 5.759e-04; rel: 2.491e-04; norm: 1.096e-01; mom: 5.175e-01;
## best it: 291; best obj: 2.311e+00
## It: 443; obj: 2.314e+00; abs: 6.129e-04; rel: 2.650e-04; norm: 1.096e-01; mom: 5.792e-01;
## best it: 291; best obj: 2.311e+00
## It: 444; obj: 2.313e+00; abs: 5.026e-04; rel: 2.172e-04; norm: 1.097e-01; mom: 1.094e+00;
## best it: 291; best obj: 2.311e+00
## It: 445; obj: 2.311e+00; abs: 1.559e-03; rel: 6.742e-04; norm: 1.096e-01; mom: 7.702e-01;
## best it: 291; best obj: 2.311e+00
## It: 446; obj: 2.312e+00; abs: 2.992e-04; rel: 1.295e-04; norm: 1.098e-01; mom: 1.063e+00;
## best it: 291; best obj: 2.311e+00
## It: 447; obj: 2.312e+00; abs: 4.148e-04; rel: 1.794e-04; norm: 1.098e-01; mom: 4.501e-01;
## best it: 291; best obj: 2.311e+00
## It: 448; obj: 2.313e+00; abs: 5.813e-04; rel: 2.514e-04; norm: 1.096e-01; mom: 6.774e-01;
## best it: 291; best obj: 2.311e+00
## It: 449; obj: 2.313e+00; abs: 6.032e-04; rel: 2.608e-04; norm: 1.096e-01; mom: 4.850e-01;
## best it: 291; best obj: 2.311e+00
## It: 450; obj: 2.314e+00; abs: 2.174e-04; rel: 9.399e-05; norm: 1.097e-01; mom: 1.156e+00;
## best it: 291; best obj: 2.311e+00

## It: 451; obj: 2.312e+00; abs: 2.039e-03; rel: 8.812e-04; norm: 1.097e-01; mom: 5.512e-01;
## best it: 291; best obj: 2.311e+00
## It: 452; obj: 2.312e+00; abs: 1.771e-04; rel: 7.661e-05; norm: 1.098e-01; mom: 1.383e+00;
## best it: 291; best obj: 2.311e+00
## It: 453; obj: 2.312e+00; abs: 2.645e-04; rel: 1.144e-04; norm: 1.098e-01; mom: 2.988e-01;
## best it: 291; best obj: 2.311e+00
## It: 454; obj: 2.313e+00; abs: 5.619e-04; rel: 2.430e-04; norm: 1.097e-01; mom: 5.532e-01;
## best it: 291; best obj: 2.311e+00
## It: 455; obj: 2.313e+00; abs: 4.300e-04; rel: 1.859e-04; norm: 1.096e-01; mom: 4.322e-01;
## best it: 291; best obj: 2.311e+00
## It: 456; obj: 2.314e+00; abs: 5.453e-04; rel: 2.357e-04; norm: 1.097e-01; mom: 9.407e-01;
## best it: 291; best obj: 2.311e+00
## It: 457; obj: 2.312e+00; abs: 1.854e-03; rel: 8.014e-04; norm: 1.097e-01; mom: 6.490e-01;
## best it: 291; best obj: 2.311e+00
## It: 458; obj: 2.311e+00; abs: 2.268e-04; rel: 9.810e-05; norm: 1.096e-01; mom: 1.248e+00;
## best it: 291; best obj: 2.311e+00
## It: 459; obj: 2.312e+00; abs: 2.766e-04; rel: 1.197e-04; norm: 1.098e-01; mom: 4.445e-01;
## best it: 291; best obj: 2.311e+00
## It: 460; obj: 2.312e+00; abs: 3.496e-04; rel: 1.512e-04; norm: 1.098e-01; mom: 4.470e-01;
## best it: 291; best obj: 2.311e+00
## It: 461; obj: 2.313e+00; abs: 5.934e-04; rel: 2.566e-04; norm: 1.097e-01; mom: 6.561e-01;

```

```

## best it: 291; best obj: 2.311e+00
## It: 462; obj: 2.313e+00; abs: 4.701e-04; rel: 2.033e-04; norm: 1.096e-01; mom: 4.555e-01;
## best it: 291; best obj: 2.311e+00
## It: 463; obj: 2.314e+00; abs: 4.675e-04; rel: 2.021e-04; norm: 1.097e-01; mom: 1.107e+00;
## best it: 291; best obj: 2.311e+00
## It: 464; obj: 2.311e+00; abs: 2.137e-03; rel: 9.235e-04; norm: 1.098e-01; mom: 4.727e-01;
## best it: 291; best obj: 2.311e+00
## It: 465; obj: 2.312e+00; abs: 1.390e-04; rel: 6.013e-05; norm: 1.098e-01; mom: 1.451e+00;
## best it: 291; best obj: 2.311e+00
## It: 466; obj: 2.312e+00; abs: 1.719e-04; rel: 7.437e-05; norm: 1.098e-01; mom: 2.405e-01;
## best it: 291; best obj: 2.311e+00
## It: 467; obj: 2.312e+00; abs: 3.809e-04; rel: 1.648e-04; norm: 1.097e-01; mom: 3.036e-01;
## best it: 291; best obj: 2.311e+00
## It: 468; obj: 2.313e+00; abs: 5.708e-04; rel: 2.469e-04; norm: 1.096e-01; mom: 5.731e-01;
## best it: 291; best obj: 2.311e+00
## It: 469; obj: 2.313e+00; abs: 6.011e-04; rel: 2.599e-04; norm: 1.096e-01; mom: 4.529e-01;
## best it: 291; best obj: 2.311e+00
## It: 470; obj: 2.314e+00; abs: 2.666e-04; rel: 1.152e-04; norm: 1.097e-01; mom: 1.168e+00;
## best it: 291; best obj: 2.311e+00
## It: 471; obj: 2.312e+00; abs: 2.054e-03; rel: 8.876e-04; norm: 1.097e-01; mom: 5.199e-01;
## best it: 291; best obj: 2.311e+00
## It: 472; obj: 2.312e+00; abs: 1.647e-04; rel: 7.124e-05; norm: 1.098e-01; mom: 1.410e+00;
## best it: 291; best obj: 2.311e+00
## It: 473; obj: 2.312e+00; abs: 2.104e-04; rel: 9.103e-05; norm: 1.098e-01; mom: 2.716e-01;
## best it: 291; best obj: 2.311e+00
## It: 474; obj: 2.312e+00; abs: 5.456e-04; rel: 2.360e-04; norm: 1.097e-01; mom: 5.035e-01;
## best it: 291; best obj: 2.311e+00
## It: 475; obj: 2.313e+00; abs: 5.290e-04; rel: 2.288e-04; norm: 1.096e-01; mom: 4.408e-01;
## best it: 291; best obj: 2.311e+00

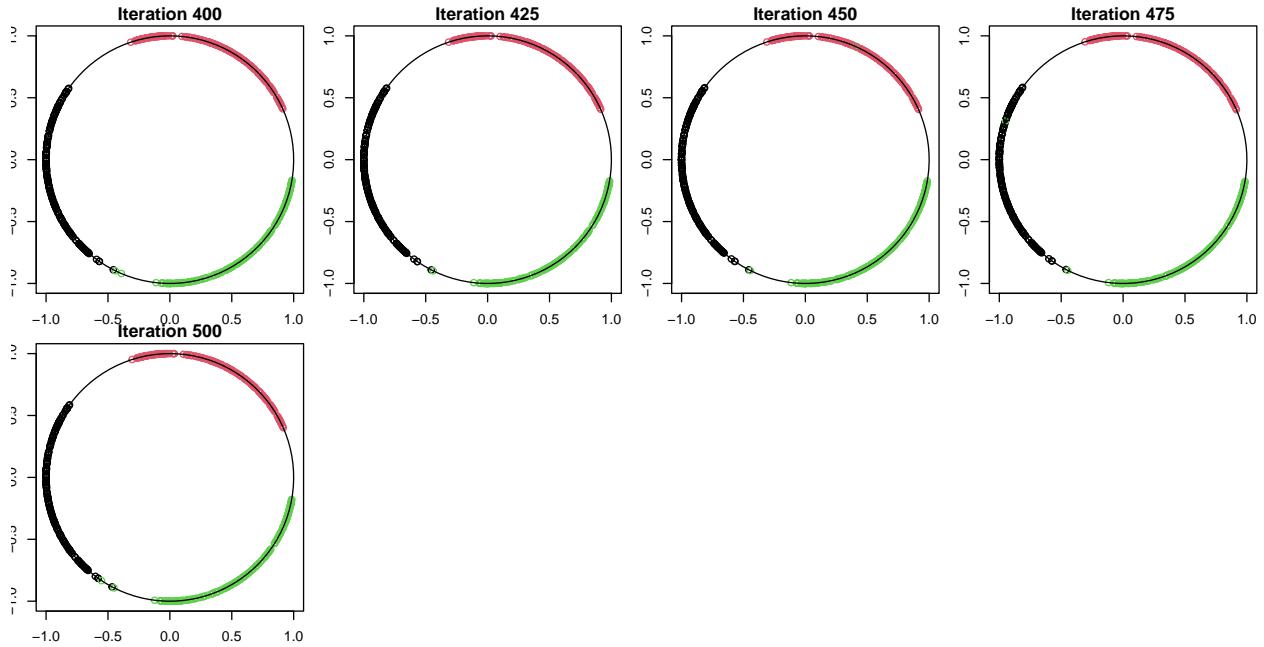
## It: 476; obj: 2.314e+00; abs: 5.465e-04; rel: 2.363e-04; norm: 1.097e-01; mom: 7.632e-01;
## best it: 291; best obj: 2.311e+00
## It: 477; obj: 2.312e+00; abs: 1.344e-03; rel: 5.808e-04; norm: 1.098e-01; mom: 8.986e-01;
## best it: 291; best obj: 2.311e+00
## It: 478; obj: 2.311e+00; abs: 7.591e-04; rel: 3.283e-04; norm: 1.096e-01; mom: 1.015e+00;
## best it: 291; best obj: 2.311e+00
## It: 479; obj: 2.312e+00; abs: 2.838e-04; rel: 1.228e-04; norm: 1.097e-01; mom: 6.549e-01;
## best it: 291; best obj: 2.311e+00
## It: 480; obj: 2.312e+00; abs: 3.430e-04; rel: 1.484e-04; norm: 1.098e-01; mom: 5.156e-01;
## best it: 291; best obj: 2.311e+00
## It: 481; obj: 2.313e+00; abs: 5.986e-04; rel: 2.589e-04; norm: 1.096e-01; mom: 6.653e-01;
## best it: 291; best obj: 2.311e+00
## It: 482; obj: 2.313e+00; abs: 4.654e-04; rel: 2.012e-04; norm: 1.096e-01; mom: 4.570e-01;
## best it: 291; best obj: 2.311e+00
## It: 483; obj: 2.314e+00; abs: 4.703e-04; rel: 2.033e-04; norm: 1.097e-01; mom: 1.103e+00;
## best it: 291; best obj: 2.311e+00
## It: 484; obj: 2.311e+00; abs: 2.134e-03; rel: 9.225e-04; norm: 1.098e-01; mom: 4.733e-01;
## best it: 291; best obj: 2.311e+00
## It: 485; obj: 2.312e+00; abs: 1.356e-04; rel: 5.867e-05; norm: 1.098e-01; mom: 1.450e+00;
## best it: 291; best obj: 2.311e+00
## It: 486; obj: 2.312e+00; abs: 1.736e-04; rel: 7.512e-05; norm: 1.098e-01; mom: 2.422e-01;
## best it: 291; best obj: 2.311e+00
## It: 487; obj: 2.312e+00; abs: 3.724e-04; rel: 1.611e-04; norm: 1.097e-01; mom: 3.015e-01;
## best it: 291; best obj: 2.311e+00

```

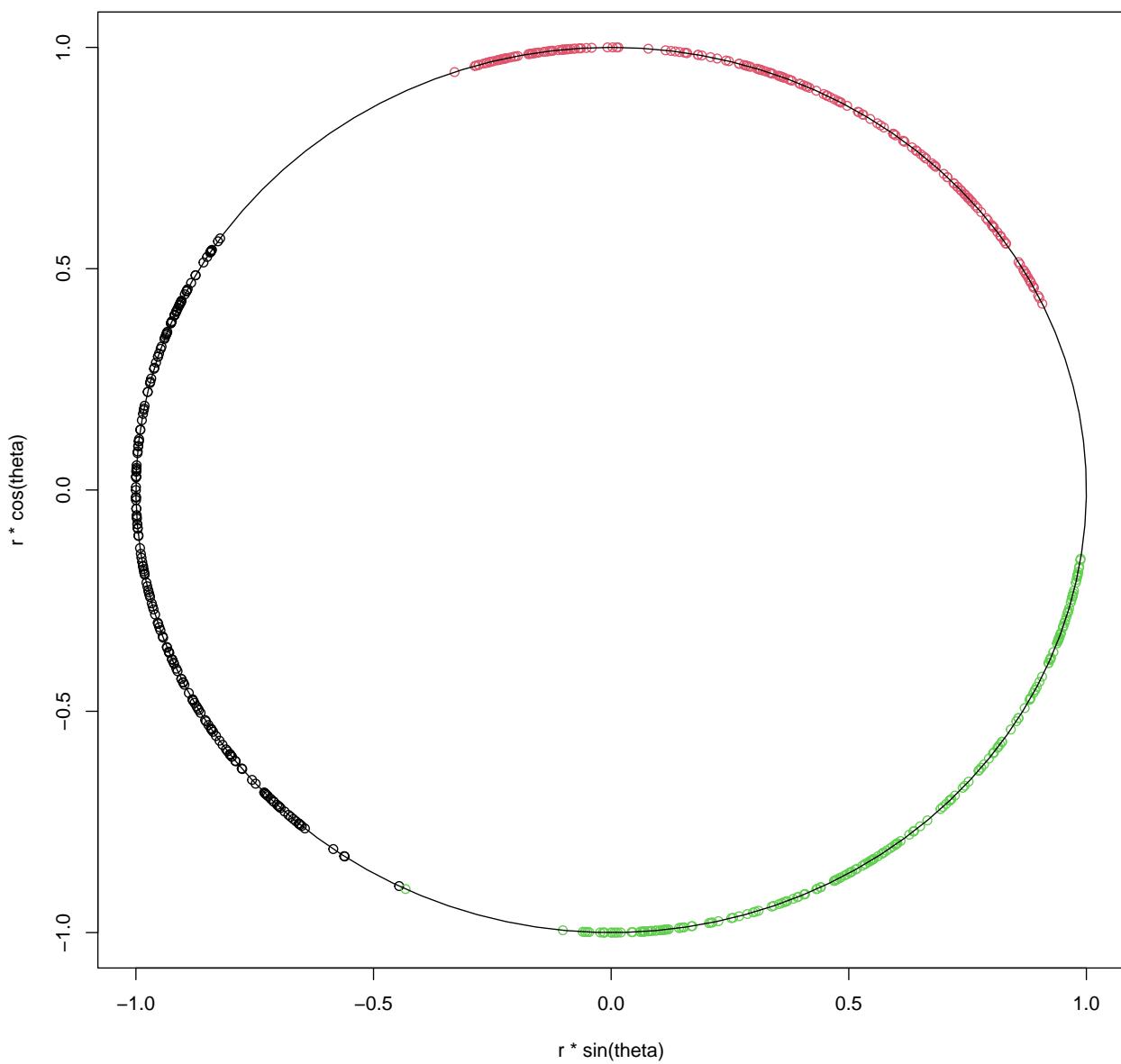
```

## It: 488; obj: 2.313e+00; abs: 5.664e-04; rel: 2.450e-04; norm: 1.096e-01; mom: 5.707e-01;
## best it: 291; best obj: 2.311e+00
## It: 489; obj: 2.313e+00; abs: 5.836e-04; rel: 2.524e-04; norm: 1.096e-01; mom: 4.453e-01;
## best it: 291; best obj: 2.311e+00
## It: 490; obj: 2.314e+00; abs: 3.189e-04; rel: 1.379e-04; norm: 1.097e-01; mom: 1.165e+00;
## best it: 291; best obj: 2.311e+00
## It: 491; obj: 2.312e+00; abs: 2.071e-03; rel: 8.953e-04; norm: 1.098e-01; mom: 5.016e-01;
## best it: 291; best obj: 2.311e+00
## It: 492; obj: 2.312e+00; abs: 1.481e-04; rel: 6.408e-05; norm: 1.098e-01; mom: 1.427e+00;
## best it: 291; best obj: 2.311e+00
## It: 493; obj: 2.312e+00; abs: 1.858e-04; rel: 8.038e-05; norm: 1.098e-01; mom: 2.604e-01;
## best it: 291; best obj: 2.311e+00
## It: 494; obj: 2.312e+00; abs: 5.354e-04; rel: 2.316e-04; norm: 1.097e-01; mom: 4.590e-01;
## best it: 291; best obj: 2.311e+00
## It: 495; obj: 2.313e+00; abs: 5.467e-04; rel: 2.364e-04; norm: 1.096e-01; mom: 4.668e-01;
## best it: 291; best obj: 2.311e+00
## It: 496; obj: 2.314e+00; abs: 5.696e-04; rel: 2.463e-04; norm: 1.096e-01; mom: 6.444e-01;
## best it: 291; best obj: 2.311e+00
## It: 497; obj: 2.313e+00; abs: 8.340e-04; rel: 3.605e-04; norm: 1.098e-01; mom: 1.030e+00;
## best it: 291; best obj: 2.311e+00
## It: 498; obj: 2.311e+00; abs: 1.241e-03; rel: 5.367e-04; norm: 1.096e-01; mom: 8.674e-01;
## best it: 291; best obj: 2.311e+00
## It: 499; obj: 2.312e+00; abs: 2.832e-04; rel: 1.225e-04; norm: 1.098e-01; mom: 8.819e-01;
## best it: 291; best obj: 2.311e+00
## It: 500; obj: 2.312e+00; abs: 3.899e-04; rel: 1.687e-04; norm: 1.098e-01; mom: 4.951e-01;
## best it: 291; best obj: 2.311e+00

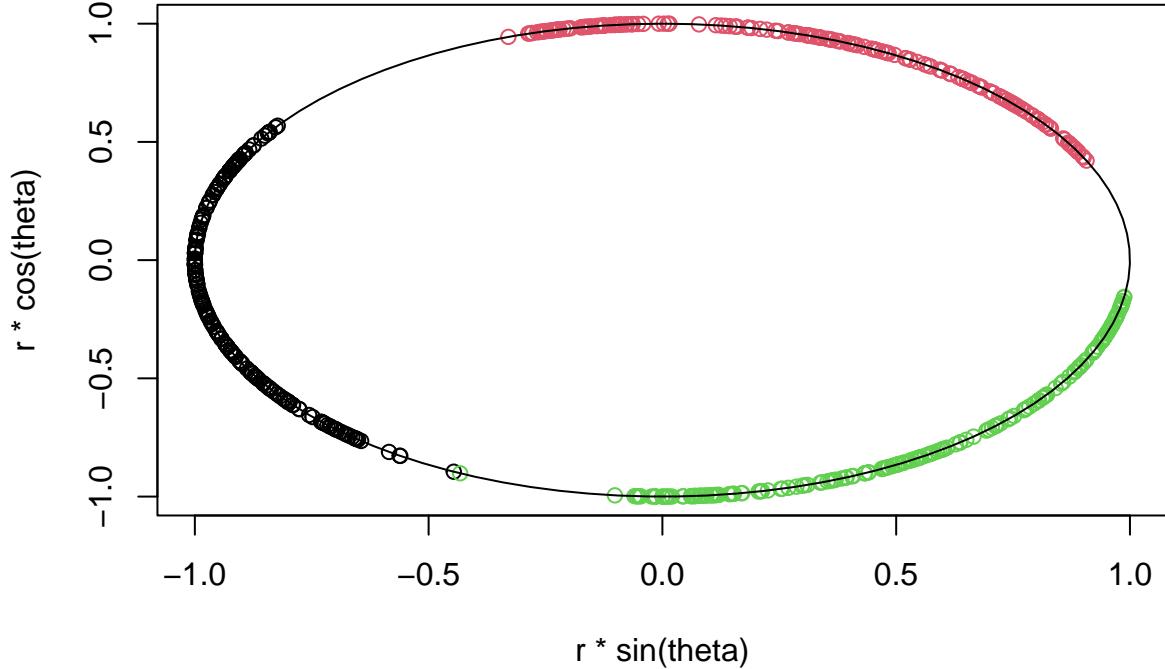
```



### Iteration 291



```
Y <- res_pscsne$best_Y  
Y_rad <- DirStats::to_rad(Y)  
r <- 1  
theta <- Y_rad  
plot(r*sin(theta),  
     r*cos(theta),  
     col=colors,  
     xlim=c(-max(r),max(r)),  
     ylim=c(-max(r),max(r)))  
  
polygon(max(r)*sin(seq(0,2*pi,length.out=100)),max(r)*cos(seq(0,2*pi,length.out=100)))
```



Now we are going to reduce to dimension  $\mathbb{S}^2$  then  $d = 2$  (sphere):

```
res_pscsne <- psc_sne(X=x_2, d=2, rho_psc_list = rho_second_perp20,
                        num_iteration=500, colors=colors, show_prog = TRUE)
```

```
## It: 1; obj: 1.918e+01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.738e-01; mom: 0.000e+00;
## best it: 1; best obj: 1.918e+01

## It: 2; obj: 1.599e+01; abs: 3.191e+00; rel: 1.664e-01; norm: 3.831e-01; mom: 9.759e+00;
## best it: 2; best obj: 1.599e+01
## It: 3; obj: 1.470e+01; abs: 1.293e+00; rel: 8.084e-02; norm: 6.835e-01; mom: 6.154e+00;
## best it: 3; best obj: 1.470e+01
## It: 4; obj: 1.416e+01; abs: 5.386e-01; rel: 3.664e-02; norm: 8.578e-01; mom: 3.211e+00;
## best it: 4; best obj: 1.416e+01
## It: 5; obj: 1.381e+01; abs: 3.464e-01; rel: 2.446e-02; norm: 9.541e-01; mom: 1.580e+00;
## best it: 5; best obj: 1.381e+01
## It: 6; obj: 1.357e+01; abs: 2.415e-01; rel: 1.748e-02; norm: 1.027e+00; mom: 1.207e+00;
## best it: 6; best obj: 1.357e+01
## It: 7; obj: 1.341e+01; abs: 1.642e-01; rel: 1.210e-02; norm: 1.088e+00; mom: 9.931e-01;
## best it: 7; best obj: 1.341e+01
## It: 8; obj: 1.329e+01; abs: 1.208e-01; rel: 9.010e-03; norm: 1.145e+00; mom: 8.031e-01;
## best it: 8; best obj: 1.329e+01
## It: 9; obj: 1.320e+01; abs: 9.014e-02; rel: 6.783e-03; norm: 1.197e+00; mom: 6.738e-01;
## best it: 9; best obj: 1.320e+01
## It: 10; obj: 1.314e+01; abs: 5.945e-02; rel: 4.504e-03; norm: 1.245e+00; mom: 6.248e-01;
## best it: 10; best obj: 1.314e+01
## It: 11; obj: 1.311e+01; abs: 3.034e-02; rel: 2.309e-03; norm: 1.290e+00; mom: 5.846e-01;
## best it: 11; best obj: 1.311e+01
## It: 12; obj: 1.310e+01; abs: 1.143e-02; rel: 8.722e-04; norm: 1.330e+00; mom: 5.319e-01;
## best it: 12; best obj: 1.310e+01
## It: 13; obj: 1.310e+01; abs: 1.813e-04; rel: 1.384e-05; norm: 1.367e+00; mom: 4.925e-01;
## best it: 12; best obj: 1.310e+01
## It: 14; obj: 1.311e+01; abs: 9.957e-03; rel: 7.603e-04; norm: 1.400e+00; mom: 4.609e-01;
```

```

## best it: 12; best obj: 1.310e+01
## It: 15; obj: 1.313e+01; abs: 2.308e-02; rel: 1.761e-03; norm: 1.429e+00; mom: 4.354e-01;
## best it: 12; best obj: 1.310e+01
## It: 16; obj: 1.316e+01; abs: 3.535e-02; rel: 2.693e-03; norm: 1.455e+00; mom: 4.101e-01;
## best it: 12; best obj: 1.310e+01
## It: 17; obj: 1.321e+01; abs: 4.165e-02; rel: 3.164e-03; norm: 1.477e+00; mom: 3.818e-01;
## best it: 12; best obj: 1.310e+01
## It: 18; obj: 1.325e+01; abs: 4.518e-02; rel: 3.421e-03; norm: 1.496e+00; mom: 3.526e-01;
## best it: 12; best obj: 1.310e+01
## It: 19; obj: 1.330e+01; abs: 4.721e-02; rel: 3.563e-03; norm: 1.512e+00; mom: 3.244e-01;
## best it: 12; best obj: 1.310e+01
## It: 20; obj: 1.334e+01; abs: 4.479e-02; rel: 3.368e-03; norm: 1.526e+00; mom: 3.004e-01;
## best it: 12; best obj: 1.310e+01
## It: 21; obj: 1.338e+01; abs: 3.812e-02; rel: 2.857e-03; norm: 1.536e+00; mom: 2.826e-01;
## best it: 12; best obj: 1.310e+01
## It: 22; obj: 1.341e+01; abs: 2.930e-02; rel: 2.190e-03; norm: 1.544e+00; mom: 2.704e-01;
## best it: 12; best obj: 1.310e+01
## It: 23; obj: 1.343e+01; abs: 2.079e-02; rel: 1.550e-03; norm: 1.551e+00; mom: 2.671e-01;
## best it: 12; best obj: 1.310e+01
## It: 24; obj: 1.345e+01; abs: 1.401e-02; rel: 1.043e-03; norm: 1.557e+00; mom: 2.722e-01;
## best it: 12; best obj: 1.310e+01
## It: 25; obj: 1.345e+01; abs: 8.646e-03; rel: 6.430e-04; norm: 1.562e+00; mom: 2.772e-01;
## best it: 12; best obj: 1.310e+01

## It: 26; obj: 1.346e+01; abs: 5.125e-03; rel: 3.809e-04; norm: 1.567e+00; mom: 2.802e-01;
## best it: 12; best obj: 1.310e+01
## It: 27; obj: 1.346e+01; abs: 4.813e-03; rel: 3.576e-04; norm: 1.572e+00; mom: 2.812e-01;
## best it: 12; best obj: 1.310e+01
## It: 28; obj: 1.347e+01; abs: 7.859e-03; rel: 5.837e-04; norm: 1.577e+00; mom: 2.760e-01;
## best it: 12; best obj: 1.310e+01
## It: 29; obj: 1.349e+01; abs: 1.315e-02; rel: 9.757e-04; norm: 1.582e+00; mom: 2.614e-01;
## best it: 12; best obj: 1.310e+01
## It: 30; obj: 1.350e+01; abs: 1.844e-02; rel: 1.367e-03; norm: 1.586e+00; mom: 2.361e-01;
## best it: 12; best obj: 1.310e+01
## It: 31; obj: 1.353e+01; abs: 2.169e-02; rel: 1.606e-03; norm: 1.590e+00; mom: 2.025e-01;
## best it: 12; best obj: 1.310e+01
## It: 32; obj: 1.355e+01; abs: 2.240e-02; rel: 1.656e-03; norm: 1.592e+00; mom: 1.669e-01;
## best it: 12; best obj: 1.310e+01
## It: 33; obj: 1.357e+01; abs: 2.130e-02; rel: 1.572e-03; norm: 1.593e+00; mom: 1.350e-01;
## best it: 12; best obj: 1.310e+01
## It: 34; obj: 1.359e+01; abs: 1.928e-02; rel: 1.421e-03; norm: 1.594e+00; mom: 1.093e-01;
## best it: 12; best obj: 1.310e+01
## It: 35; obj: 1.361e+01; abs: 1.695e-02; rel: 1.248e-03; norm: 1.594e+00; mom: 8.938e-02;
## best it: 12; best obj: 1.310e+01
## It: 36; obj: 1.362e+01; abs: 1.465e-02; rel: 1.077e-03; norm: 1.594e+00; mom: 7.420e-02;
## best it: 12; best obj: 1.310e+01
## It: 37; obj: 1.363e+01; abs: 1.252e-02; rel: 9.189e-04; norm: 1.593e+00; mom: 6.265e-02;
## best it: 12; best obj: 1.310e+01
## It: 38; obj: 1.364e+01; abs: 1.060e-02; rel: 7.776e-04; norm: 1.592e+00; mom: 5.395e-02;
## best it: 12; best obj: 1.310e+01
## It: 39; obj: 1.365e+01; abs: 8.911e-03; rel: 6.532e-04; norm: 1.591e+00; mom: 4.755e-02;
## best it: 12; best obj: 1.310e+01
## It: 40; obj: 1.366e+01; abs: 7.435e-03; rel: 5.446e-04; norm: 1.590e+00; mom: 4.301e-02;
## best it: 12; best obj: 1.310e+01

```

```

## It: 41; obj: 1.367e+01; abs: 6.152e-03; rel: 4.504e-04; norm: 1.589e+00; mom: 3.982e-02;
## best it: 12; best obj: 1.310e+01
## It: 42; obj: 1.367e+01; abs: 5.041e-03; rel: 3.689e-04; norm: 1.588e+00; mom: 3.750e-02;
## best it: 12; best obj: 1.310e+01
## It: 43; obj: 1.367e+01; abs: 4.080e-03; rel: 2.985e-04; norm: 1.586e+00; mom: 3.571e-02;
## best it: 12; best obj: 1.310e+01
## It: 44; obj: 1.368e+01; abs: 3.251e-03; rel: 2.377e-04; norm: 1.585e+00; mom: 3.423e-02;
## best it: 12; best obj: 1.310e+01
## It: 45; obj: 1.368e+01; abs: 2.535e-03; rel: 1.853e-04; norm: 1.584e+00; mom: 3.295e-02;
## best it: 12; best obj: 1.310e+01
## It: 46; obj: 1.368e+01; abs: 1.918e-03; rel: 1.402e-04; norm: 1.582e+00; mom: 3.182e-02;
## best it: 12; best obj: 1.310e+01
## It: 47; obj: 1.368e+01; abs: 1.387e-03; rel: 1.014e-04; norm: 1.581e+00; mom: 3.080e-02;
## best it: 12; best obj: 1.310e+01
## It: 48; obj: 1.368e+01; abs: 9.300e-04; rel: 6.797e-05; norm: 1.579e+00; mom: 2.986e-02;
## best it: 12; best obj: 1.310e+01
## It: 49; obj: 1.369e+01; abs: 5.372e-04; rel: 3.926e-05; norm: 1.578e+00; mom: 2.898e-02;
## best it: 12; best obj: 1.310e+01
## It: 50; obj: 1.369e+01; abs: 1.999e-04; rel: 1.461e-05; norm: 1.576e+00; mom: 2.817e-02;
## best it: 12; best obj: 1.310e+01

## It: 51; obj: 1.369e+01; abs: 8.932e-05; rel: 6.527e-06; norm: 1.574e+00; mom: 2.742e-02;
## best it: 12; best obj: 1.310e+01
## It: 52; obj: 1.369e+01; abs: 3.370e-04; rel: 2.463e-05; norm: 1.573e+00; mom: 2.671e-02;
## best it: 12; best obj: 1.310e+01
## It: 53; obj: 1.368e+01; abs: 5.489e-04; rel: 4.011e-05; norm: 1.571e+00; mom: 2.605e-02;
## best it: 12; best obj: 1.310e+01
## It: 54; obj: 1.368e+01; abs: 7.297e-04; rel: 5.332e-05; norm: 1.570e+00; mom: 2.544e-02;
## best it: 12; best obj: 1.310e+01
## It: 55; obj: 1.368e+01; abs: 8.837e-04; rel: 6.458e-05; norm: 1.568e+00; mom: 2.487e-02;
## best it: 12; best obj: 1.310e+01
## It: 56; obj: 1.368e+01; abs: 1.015e-03; rel: 7.415e-05; norm: 1.567e+00; mom: 2.435e-02;
## best it: 12; best obj: 1.310e+01
## It: 57; obj: 1.368e+01; abs: 1.126e-03; rel: 8.227e-05; norm: 1.565e+00; mom: 2.387e-02;
## best it: 12; best obj: 1.310e+01
## It: 58; obj: 1.368e+01; abs: 1.219e-03; rel: 8.913e-05; norm: 1.564e+00; mom: 2.345e-02;
## best it: 12; best obj: 1.310e+01
## It: 59; obj: 1.368e+01; abs: 1.298e-03; rel: 9.491e-05; norm: 1.562e+00; mom: 2.307e-02;
## best it: 12; best obj: 1.310e+01
## It: 60; obj: 1.368e+01; abs: 1.365e-03; rel: 9.977e-05; norm: 1.561e+00; mom: 2.274e-02;
## best it: 12; best obj: 1.310e+01
## It: 61; obj: 1.368e+01; abs: 1.420e-03; rel: 1.038e-04; norm: 1.560e+00; mom: 2.245e-02;
## best it: 12; best obj: 1.310e+01
## It: 62; obj: 1.367e+01; abs: 1.466e-03; rel: 1.072e-04; norm: 1.558e+00; mom: 2.221e-02;
## best it: 12; best obj: 1.310e+01
## It: 63; obj: 1.367e+01; abs: 1.504e-03; rel: 1.100e-04; norm: 1.557e+00; mom: 2.200e-02;
## best it: 12; best obj: 1.310e+01
## It: 64; obj: 1.367e+01; abs: 1.535e-03; rel: 1.123e-04; norm: 1.556e+00; mom: 2.182e-02;
## best it: 12; best obj: 1.310e+01
## It: 65; obj: 1.367e+01; abs: 1.560e-03; rel: 1.141e-04; norm: 1.554e+00; mom: 2.166e-02;
## best it: 12; best obj: 1.310e+01
## It: 66; obj: 1.367e+01; abs: 1.580e-03; rel: 1.156e-04; norm: 1.553e+00; mom: 2.152e-02;
## best it: 12; best obj: 1.310e+01
## It: 67; obj: 1.367e+01; abs: 1.596e-03; rel: 1.167e-04; norm: 1.552e+00; mom: 2.139e-02;

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## best it: 12; best obj: 1.310e+01
## It: 68; obj: 1.366e+01; abs: 1.607e-03; rel: 1.176e-04; norm: 1.550e+00; mom: 2.128e-02;
## best it: 12; best obj: 1.310e+01
## It: 69; obj: 1.366e+01; abs: 1.616e-03; rel: 1.182e-04; norm: 1.549e+00; mom: 2.117e-02;
## best it: 12; best obj: 1.310e+01
## It: 70; obj: 1.366e+01; abs: 1.621e-03; rel: 1.187e-04; norm: 1.548e+00; mom: 2.106e-02;
## best it: 12; best obj: 1.310e+01
## It: 71; obj: 1.366e+01; abs: 1.624e-03; rel: 1.189e-04; norm: 1.547e+00; mom: 2.096e-02;
## best it: 12; best obj: 1.310e+01
## It: 72; obj: 1.366e+01; abs: 1.625e-03; rel: 1.190e-04; norm: 1.546e+00; mom: 2.086e-02;
## best it: 12; best obj: 1.310e+01
## It: 73; obj: 1.366e+01; abs: 1.624e-03; rel: 1.189e-04; norm: 1.545e+00; mom: 2.076e-02;
## best it: 12; best obj: 1.310e+01
## It: 74; obj: 1.365e+01; abs: 1.620e-03; rel: 1.186e-04; norm: 1.544e+00; mom: 2.066e-02;
## best it: 12; best obj: 1.310e+01
## It: 75; obj: 1.365e+01; abs: 1.615e-03; rel: 1.183e-04; norm: 1.542e+00; mom: 2.056e-02;
## best it: 12; best obj: 1.310e+01

## It: 76; obj: 1.365e+01; abs: 1.608e-03; rel: 1.178e-04; norm: 1.541e+00; mom: 2.045e-02;
## best it: 12; best obj: 1.310e+01
## It: 77; obj: 1.365e+01; abs: 1.600e-03; rel: 1.172e-04; norm: 1.540e+00; mom: 2.035e-02;
## best it: 12; best obj: 1.310e+01
## It: 78; obj: 1.365e+01; abs: 1.590e-03; rel: 1.165e-04; norm: 1.540e+00; mom: 2.024e-02;
## best it: 12; best obj: 1.310e+01
## It: 79; obj: 1.365e+01; abs: 1.578e-03; rel: 1.156e-04; norm: 1.539e+00; mom: 2.013e-02;
## best it: 12; best obj: 1.310e+01
## It: 80; obj: 1.365e+01; abs: 1.565e-03; rel: 1.147e-04; norm: 1.538e+00; mom: 2.001e-02;
## best it: 12; best obj: 1.310e+01
## It: 81; obj: 1.364e+01; abs: 1.551e-03; rel: 1.137e-04; norm: 1.537e+00; mom: 1.989e-02;
## best it: 12; best obj: 1.310e+01
## It: 82; obj: 1.364e+01; abs: 1.535e-03; rel: 1.125e-04; norm: 1.536e+00; mom: 1.977e-02;
## best it: 12; best obj: 1.310e+01
## It: 83; obj: 1.364e+01; abs: 1.518e-03; rel: 1.112e-04; norm: 1.535e+00; mom: 1.964e-02;
## best it: 12; best obj: 1.310e+01
## It: 84; obj: 1.364e+01; abs: 1.499e-03; rel: 1.099e-04; norm: 1.534e+00; mom: 1.951e-02;
## best it: 12; best obj: 1.310e+01
## It: 85; obj: 1.364e+01; abs: 1.479e-03; rel: 1.084e-04; norm: 1.534e+00; mom: 1.937e-02;
## best it: 12; best obj: 1.310e+01
## It: 86; obj: 1.364e+01; abs: 1.458e-03; rel: 1.069e-04; norm: 1.533e+00; mom: 1.923e-02;
## best it: 12; best obj: 1.310e+01
## It: 87; obj: 1.363e+01; abs: 1.435e-03; rel: 1.052e-04; norm: 1.532e+00; mom: 1.909e-02;
## best it: 12; best obj: 1.310e+01
## It: 88; obj: 1.363e+01; abs: 1.411e-03; rel: 1.035e-04; norm: 1.532e+00; mom: 1.894e-02;
## best it: 12; best obj: 1.310e+01
## It: 89; obj: 1.363e+01; abs: 1.386e-03; rel: 1.017e-04; norm: 1.531e+00; mom: 1.879e-02;
## best it: 12; best obj: 1.310e+01
## It: 90; obj: 1.363e+01; abs: 1.361e-03; rel: 9.980e-05; norm: 1.530e+00; mom: 1.864e-02;
## best it: 12; best obj: 1.310e+01
## It: 91; obj: 1.363e+01; abs: 1.334e-03; rel: 9.784e-05; norm: 1.530e+00; mom: 1.848e-02;
## best it: 12; best obj: 1.310e+01
## It: 92; obj: 1.363e+01; abs: 1.306e-03; rel: 9.581e-05; norm: 1.529e+00; mom: 1.832e-02;
## best it: 12; best obj: 1.310e+01
## It: 93; obj: 1.363e+01; abs: 1.277e-03; rel: 9.373e-05; norm: 1.529e+00; mom: 1.816e-02;
## best it: 12; best obj: 1.310e+01

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## It: 94; obj: 1.363e+01; abs: 1.248e-03; rel: 9.159e-05; norm: 1.529e+00; mom: 1.800e-02;
## best it: 12; best obj: 1.310e+01
## It: 95; obj: 1.362e+01; abs: 1.218e-03; rel: 8.940e-05; norm: 1.528e+00; mom: 1.784e-02;
## best it: 12; best obj: 1.310e+01
## It: 96; obj: 1.362e+01; abs: 1.188e-03; rel: 8.718e-05; norm: 1.528e+00; mom: 1.768e-02;
## best it: 12; best obj: 1.310e+01
## It: 97; obj: 1.362e+01; abs: 1.157e-03; rel: 8.492e-05; norm: 1.528e+00; mom: 1.752e-02;
## best it: 12; best obj: 1.310e+01
## It: 98; obj: 1.362e+01; abs: 1.126e-03; rel: 8.263e-05; norm: 1.527e+00; mom: 1.735e-02;
## best it: 12; best obj: 1.310e+01
## It: 99; obj: 1.362e+01; abs: 1.094e-03; rel: 8.032e-05; norm: 1.527e+00; mom: 1.719e-02;
## best it: 12; best obj: 1.310e+01
## It: 100; obj: 1.362e+01; abs: 1.062e-03; rel: 7.799e-05; norm: 1.527e+00; mom: 1.703e-02;
## best it: 12; best obj: 1.310e+01

## It: 101; obj: 1.980e+00; abs: 1.164e+01; rel: 8.546e-01; norm: 1.305e-01; mom: 1.687e-02;
## best it: 101; best obj: 1.980e+00
## It: 102; obj: 1.831e+00; abs: 1.496e-01; rel: 7.552e-02; norm: 1.310e-01; mom: 4.628e+00;
## best it: 102; best obj: 1.831e+00
## It: 103; obj: 1.745e+00; abs: 8.572e-02; rel: 4.682e-02; norm: 1.465e-01; mom: 4.317e+00;
## best it: 103; best obj: 1.745e+00
## It: 104; obj: 1.748e+00; abs: 2.816e-03; rel: 1.614e-03; norm: 1.491e-01; mom: 4.381e+00;
## best it: 103; best obj: 1.745e+00
## It: 105; obj: 1.784e+00; abs: 3.604e-02; rel: 2.062e-02; norm: 1.490e-01; mom: 3.492e+00;
## best it: 103; best obj: 1.745e+00
## It: 106; obj: 1.782e+00; abs: 2.200e-03; rel: 1.233e-03; norm: 1.486e-01; mom: 4.493e+00;
## best it: 103; best obj: 1.745e+00
## It: 107; obj: 1.769e+00; abs: 1.285e-02; rel: 7.209e-03; norm: 1.494e-01; mom: 4.618e+00;
## best it: 103; best obj: 1.745e+00
## It: 108; obj: 1.759e+00; abs: 9.476e-03; rel: 5.357e-03; norm: 1.484e-01; mom: 4.269e+00;
## best it: 103; best obj: 1.745e+00
## It: 109; obj: 1.754e+00; abs: 5.528e-03; rel: 3.142e-03; norm: 1.484e-01; mom: 4.118e+00;
## best it: 103; best obj: 1.745e+00
## It: 110; obj: 1.762e+00; abs: 7.656e-03; rel: 4.365e-03; norm: 1.491e-01; mom: 3.937e+00;
## best it: 103; best obj: 1.745e+00
## It: 111; obj: 1.769e+00; abs: 7.396e-03; rel: 4.199e-03; norm: 1.489e-01; mom: 4.149e+00;
## best it: 103; best obj: 1.745e+00
## It: 112; obj: 1.754e+00; abs: 1.471e-02; rel: 8.316e-03; norm: 1.491e-01; mom: 4.235e+00;
## best it: 103; best obj: 1.745e+00
## It: 113; obj: 1.764e+00; abs: 9.663e-03; rel: 5.508e-03; norm: 1.497e-01; mom: 4.216e+00;
## best it: 103; best obj: 1.745e+00
## It: 114; obj: 1.786e+00; abs: 2.178e-02; rel: 1.235e-02; norm: 1.498e-01; mom: 4.295e+00;
## best it: 103; best obj: 1.745e+00
## It: 115; obj: 1.765e+00; abs: 2.019e-02; rel: 1.130e-02; norm: 1.507e-01; mom: 4.510e+00;
## best it: 103; best obj: 1.745e+00
## It: 116; obj: 1.759e+00; abs: 6.257e-03; rel: 3.544e-03; norm: 1.493e-01; mom: 4.614e+00;
## best it: 103; best obj: 1.745e+00
## It: 117; obj: 1.790e+00; abs: 3.035e-02; rel: 1.725e-02; norm: 1.510e-01; mom: 4.367e+00;
## best it: 103; best obj: 1.745e+00
## It: 118; obj: 1.801e+00; abs: 1.101e-02; rel: 6.151e-03; norm: 1.498e-01; mom: 4.210e+00;
## best it: 103; best obj: 1.745e+00
## It: 119; obj: 1.793e+00; abs: 7.251e-03; rel: 4.027e-03; norm: 1.508e-01; mom: 4.315e+00;
## best it: 103; best obj: 1.745e+00
## It: 120; obj: 1.769e+00; abs: 2.416e-02; rel: 1.347e-02; norm: 1.503e-01; mom: 4.355e+00;

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## best it: 103; best obj: 1.745e+00
## It: 121; obj: 1.732e+00; abs: 3.694e-02; rel: 2.088e-02; norm: 1.491e-01; mom: 4.264e+00;
## best it: 121; best obj: 1.732e+00
## It: 122; obj: 1.753e+00; abs: 2.045e-02; rel: 1.181e-02; norm: 1.494e-01; mom: 3.824e+00;
## best it: 121; best obj: 1.732e+00
## It: 123; obj: 1.762e+00; abs: 9.041e-03; rel: 5.158e-03; norm: 1.503e-01; mom: 3.614e+00;
## best it: 121; best obj: 1.732e+00
## It: 124; obj: 1.742e+00; abs: 1.988e-02; rel: 1.128e-02; norm: 1.483e-01; mom: 4.201e+00;
## best it: 121; best obj: 1.732e+00
## It: 125; obj: 1.750e+00; abs: 7.824e-03; rel: 4.492e-03; norm: 1.491e-01; mom: 3.759e+00;
## best it: 121; best obj: 1.732e+00

## It: 126; obj: 1.757e+00; abs: 7.470e-03; rel: 4.270e-03; norm: 1.487e-01; mom: 3.724e+00;
## best it: 121; best obj: 1.732e+00
## It: 127; obj: 1.743e+00; abs: 1.460e-02; rel: 8.309e-03; norm: 1.479e-01; mom: 3.845e+00;
## best it: 121; best obj: 1.732e+00
## It: 128; obj: 1.747e+00; abs: 4.310e-03; rel: 2.474e-03; norm: 1.493e-01; mom: 3.862e+00;
## best it: 121; best obj: 1.732e+00
## It: 129; obj: 1.735e+00; abs: 1.221e-02; rel: 6.989e-03; norm: 1.490e-01; mom: 3.642e+00;
## best it: 121; best obj: 1.732e+00
## It: 130; obj: 1.716e+00; abs: 1.861e-02; rel: 1.073e-02; norm: 1.497e-01; mom: 3.543e+00;
## best it: 130; best obj: 1.716e+00
## It: 131; obj: 1.717e+00; abs: 1.190e-03; rel: 6.932e-04; norm: 1.492e-01; mom: 3.485e+00;
## best it: 130; best obj: 1.716e+00
## It: 132; obj: 1.713e+00; abs: 4.181e-03; rel: 2.435e-03; norm: 1.481e-01; mom: 3.332e+00;
## best it: 132; best obj: 1.713e+00
## It: 133; obj: 1.722e+00; abs: 8.837e-03; rel: 5.158e-03; norm: 1.491e-01; mom: 3.316e+00;
## best it: 132; best obj: 1.713e+00
## It: 134; obj: 1.739e+00; abs: 1.693e-02; rel: 9.834e-03; norm: 1.511e-01; mom: 3.488e+00;
## best it: 132; best obj: 1.713e+00
## It: 135; obj: 1.738e+00; abs: 8.638e-04; rel: 4.967e-04; norm: 1.487e-01; mom: 3.505e+00;
## best it: 132; best obj: 1.713e+00
## It: 136; obj: 1.734e+00; abs: 3.996e-03; rel: 2.299e-03; norm: 1.488e-01; mom: 3.562e+00;
## best it: 132; best obj: 1.713e+00
## It: 137; obj: 1.744e+00; abs: 9.867e-03; rel: 5.691e-03; norm: 1.493e-01; mom: 3.515e+00;
## best it: 132; best obj: 1.713e+00
## It: 138; obj: 1.740e+00; abs: 3.625e-03; rel: 2.079e-03; norm: 1.498e-01; mom: 3.568e+00;
## best it: 132; best obj: 1.713e+00
## It: 139; obj: 1.712e+00; abs: 2.773e-02; rel: 1.594e-02; norm: 1.497e-01; mom: 3.685e+00;
## best it: 139; best obj: 1.712e+00
## It: 140; obj: 1.711e+00; abs: 1.173e-03; rel: 6.849e-04; norm: 1.497e-01; mom: 3.484e+00;
## best it: 140; best obj: 1.711e+00
## It: 141; obj: 1.722e+00; abs: 1.054e-02; rel: 6.160e-03; norm: 1.493e-01; mom: 3.049e+00;
## best it: 140; best obj: 1.711e+00
## It: 142; obj: 1.719e+00; abs: 3.021e-03; rel: 1.755e-03; norm: 1.501e-01; mom: 3.140e+00;
## best it: 140; best obj: 1.711e+00
## It: 143; obj: 1.711e+00; abs: 7.790e-03; rel: 4.532e-03; norm: 1.502e-01; mom: 3.261e+00;
## best it: 143; best obj: 1.711e+00
## It: 144; obj: 1.720e+00; abs: 9.112e-03; rel: 5.325e-03; norm: 1.489e-01; mom: 3.155e+00;
## best it: 143; best obj: 1.711e+00
## It: 145; obj: 1.723e+00; abs: 2.865e-03; rel: 1.666e-03; norm: 1.502e-01; mom: 3.526e+00;
## best it: 143; best obj: 1.711e+00
## It: 146; obj: 1.720e+00; abs: 2.894e-03; rel: 1.680e-03; norm: 1.503e-01; mom: 3.571e+00;
## best it: 143; best obj: 1.711e+00

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## It: 147; obj: 1.724e+00; abs: 4.133e-03; rel: 2.403e-03; norm: 1.500e-01; mom: 3.723e+00;
## best it: 143; best obj: 1.711e+00
## It: 148; obj: 1.728e+00; abs: 4.066e-03; rel: 2.358e-03; norm: 1.499e-01; mom: 3.307e+00;
## best it: 143; best obj: 1.711e+00
## It: 149; obj: 1.732e+00; abs: 4.031e-03; rel: 2.332e-03; norm: 1.507e-01; mom: 3.429e+00;
## best it: 143; best obj: 1.711e+00
## It: 150; obj: 1.711e+00; abs: 2.105e-02; rel: 1.215e-02; norm: 1.499e-01; mom: 3.652e+00;
## best it: 143; best obj: 1.711e+00

## It: 151; obj: 1.716e+00; abs: 4.659e-03; rel: 2.723e-03; norm: 1.492e-01; mom: 3.442e+00;
## best it: 143; best obj: 1.711e+00
## It: 152; obj: 1.713e+00; abs: 3.108e-03; rel: 1.811e-03; norm: 1.500e-01; mom: 3.313e+00;
## best it: 143; best obj: 1.711e+00
## It: 153; obj: 1.710e+00; abs: 2.644e-03; rel: 1.544e-03; norm: 1.490e-01; mom: 3.446e+00;
## best it: 153; best obj: 1.710e+00
## It: 154; obj: 1.729e+00; abs: 1.876e-02; rel: 1.097e-02; norm: 1.512e-01; mom: 3.360e+00;
## best it: 153; best obj: 1.710e+00
## It: 155; obj: 1.718e+00; abs: 1.107e-02; rel: 6.401e-03; norm: 1.521e-01; mom: 3.932e+00;
## best it: 153; best obj: 1.710e+00
## It: 156; obj: 1.701e+00; abs: 1.678e-02; rel: 9.768e-03; norm: 1.504e-01; mom: 3.711e+00;
## best it: 156; best obj: 1.701e+00
## It: 157; obj: 1.690e+00; abs: 1.094e-02; rel: 6.430e-03; norm: 1.498e-01; mom: 3.375e+00;
## best it: 157; best obj: 1.690e+00
## It: 158; obj: 1.705e+00; abs: 1.466e-02; rel: 8.674e-03; norm: 1.504e-01; mom: 3.350e+00;
## best it: 157; best obj: 1.690e+00
## It: 159; obj: 1.712e+00; abs: 6.703e-03; rel: 3.932e-03; norm: 1.499e-01; mom: 3.241e+00;
## best it: 157; best obj: 1.690e+00
## It: 160; obj: 1.715e+00; abs: 3.813e-03; rel: 2.228e-03; norm: 1.513e-01; mom: 3.260e+00;
## best it: 157; best obj: 1.690e+00
## It: 161; obj: 1.726e+00; abs: 1.082e-02; rel: 6.308e-03; norm: 1.518e-01; mom: 3.508e+00;
## best it: 157; best obj: 1.690e+00
## It: 162; obj: 1.711e+00; abs: 1.518e-02; rel: 8.796e-03; norm: 1.504e-01; mom: 3.647e+00;
## best it: 157; best obj: 1.690e+00
## It: 163; obj: 1.715e+00; abs: 3.806e-03; rel: 2.225e-03; norm: 1.502e-01; mom: 3.426e+00;
## best it: 157; best obj: 1.690e+00
## It: 164; obj: 1.720e+00; abs: 4.892e-03; rel: 2.853e-03; norm: 1.509e-01; mom: 3.530e+00;
## best it: 157; best obj: 1.690e+00
## It: 165; obj: 1.700e+00; abs: 1.941e-02; rel: 1.129e-02; norm: 1.499e-01; mom: 3.302e+00;
## best it: 157; best obj: 1.690e+00
## It: 166; obj: 1.696e+00; abs: 4.263e-03; rel: 2.507e-03; norm: 1.514e-01; mom: 3.201e+00;
## best it: 157; best obj: 1.690e+00
## It: 167; obj: 1.723e+00; abs: 2.669e-02; rel: 1.573e-02; norm: 1.503e-01; mom: 3.421e+00;
## best it: 157; best obj: 1.690e+00
## It: 168; obj: 1.704e+00; abs: 1.897e-02; rel: 1.101e-02; norm: 1.501e-01; mom: 3.466e+00;
## best it: 157; best obj: 1.690e+00
## It: 169; obj: 1.681e+00; abs: 2.263e-02; rel: 1.328e-02; norm: 1.500e-01; mom: 3.574e+00;
## best it: 169; best obj: 1.681e+00
## It: 170; obj: 1.684e+00; abs: 2.902e-03; rel: 1.726e-03; norm: 1.506e-01; mom: 3.266e+00;
## best it: 169; best obj: 1.681e+00
## It: 171; obj: 1.690e+00; abs: 5.910e-03; rel: 3.509e-03; norm: 1.496e-01; mom: 3.171e+00;
## best it: 169; best obj: 1.681e+00
## It: 172; obj: 1.689e+00; abs: 1.243e-03; rel: 7.358e-04; norm: 1.513e-01; mom: 3.017e+00;
## best it: 169; best obj: 1.681e+00
## It: 173; obj: 1.679e+00; abs: 9.329e-03; rel: 5.525e-03; norm: 1.506e-01; mom: 3.382e+00;

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## best it: 173; best obj: 1.679e+00
## It: 174; obj: 1.674e+00; abs: 4.877e-03; rel: 2.904e-03; norm: 1.500e-01; mom: 3.095e+00;
## best it: 174; best obj: 1.674e+00
## It: 175; obj: 1.689e+00; abs: 1.459e-02; rel: 8.712e-03; norm: 1.489e-01; mom: 2.859e+00;
## best it: 174; best obj: 1.674e+00

## It: 176; obj: 1.695e+00; abs: 5.674e-03; rel: 3.359e-03; norm: 1.496e-01; mom: 3.159e+00;
## best it: 174; best obj: 1.674e+00
## It: 177; obj: 1.699e+00; abs: 4.496e-03; rel: 2.653e-03; norm: 1.500e-01; mom: 3.072e+00;
## best it: 174; best obj: 1.674e+00
## It: 178; obj: 1.689e+00; abs: 9.717e-03; rel: 5.718e-03; norm: 1.496e-01; mom: 3.200e+00;
## best it: 174; best obj: 1.674e+00
## It: 179; obj: 1.703e+00; abs: 1.351e-02; rel: 7.995e-03; norm: 1.511e-01; mom: 3.351e+00;
## best it: 174; best obj: 1.674e+00
## It: 180; obj: 1.713e+00; abs: 1.003e-02; rel: 5.890e-03; norm: 1.504e-01; mom: 3.238e+00;
## best it: 174; best obj: 1.674e+00
## It: 181; obj: 1.696e+00; abs: 1.718e-02; rel: 1.003e-02; norm: 1.504e-01; mom: 3.380e+00;
## best it: 174; best obj: 1.674e+00
## It: 182; obj: 1.686e+00; abs: 1.031e-02; rel: 6.081e-03; norm: 1.506e-01; mom: 3.419e+00;
## best it: 174; best obj: 1.674e+00
## It: 183; obj: 1.709e+00; abs: 2.300e-02; rel: 1.365e-02; norm: 1.503e-01; mom: 3.134e+00;
## best it: 174; best obj: 1.674e+00
## It: 184; obj: 1.693e+00; abs: 1.511e-02; rel: 8.844e-03; norm: 1.497e-01; mom: 3.414e+00;
## best it: 174; best obj: 1.674e+00
## It: 185; obj: 1.687e+00; abs: 6.481e-03; rel: 3.827e-03; norm: 1.493e-01; mom: 3.118e+00;
## best it: 174; best obj: 1.674e+00
## It: 186; obj: 1.718e+00; abs: 3.154e-02; rel: 1.869e-02; norm: 1.508e-01; mom: 3.115e+00;
## best it: 174; best obj: 1.674e+00
## It: 187; obj: 1.720e+00; abs: 1.377e-03; rel: 8.014e-04; norm: 1.502e-01; mom: 3.410e+00;
## best it: 174; best obj: 1.674e+00
## It: 188; obj: 1.718e+00; abs: 1.441e-03; rel: 8.377e-04; norm: 1.506e-01; mom: 3.627e+00;
## best it: 174; best obj: 1.674e+00
## It: 189; obj: 1.718e+00; abs: 1.527e-04; rel: 8.887e-05; norm: 1.502e-01; mom: 3.626e+00;
## best it: 174; best obj: 1.674e+00
## It: 190; obj: 1.710e+00; abs: 8.322e-03; rel: 4.843e-03; norm: 1.502e-01; mom: 3.504e+00;
## best it: 174; best obj: 1.674e+00
## It: 191; obj: 1.726e+00; abs: 1.577e-02; rel: 9.220e-03; norm: 1.507e-01; mom: 3.535e+00;
## best it: 174; best obj: 1.674e+00
## It: 192; obj: 1.739e+00; abs: 1.324e-02; rel: 7.674e-03; norm: 1.514e-01; mom: 3.443e+00;
## best it: 174; best obj: 1.674e+00
## It: 193; obj: 1.715e+00; abs: 2.413e-02; rel: 1.388e-02; norm: 1.502e-01; mom: 3.623e+00;
## best it: 174; best obj: 1.674e+00
## It: 194; obj: 1.715e+00; abs: 7.892e-05; rel: 4.602e-05; norm: 1.506e-01; mom: 3.589e+00;
## best it: 174; best obj: 1.674e+00
## It: 195; obj: 1.720e+00; abs: 4.645e-03; rel: 2.709e-03; norm: 1.513e-01; mom: 3.378e+00;
## best it: 174; best obj: 1.674e+00
## It: 196; obj: 1.708e+00; abs: 1.150e-02; rel: 6.688e-03; norm: 1.497e-01; mom: 3.493e+00;
## best it: 174; best obj: 1.674e+00
## It: 197; obj: 1.703e+00; abs: 4.716e-03; rel: 2.761e-03; norm: 1.504e-01; mom: 3.526e+00;
## best it: 174; best obj: 1.674e+00
## It: 198; obj: 1.704e+00; abs: 8.120e-04; rel: 4.767e-04; norm: 1.500e-01; mom: 3.275e+00;
## best it: 174; best obj: 1.674e+00
## It: 199; obj: 1.713e+00; abs: 8.959e-03; rel: 5.257e-03; norm: 1.507e-01; mom: 3.331e+00;
## best it: 174; best obj: 1.674e+00

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## It: 200; obj: 1.712e+00; abs: 1.193e-03; rel: 6.966e-04; norm: 1.496e-01; mom: 3.578e+00;
## best it: 174; best obj: 1.674e+00

## It: 201; obj: 1.719e+00; abs: 7.284e-03; rel: 4.255e-03; norm: 1.499e-01; mom: 3.364e+00;
## best it: 174; best obj: 1.674e+00

## It: 202; obj: 1.722e+00; abs: 3.013e-03; rel: 1.753e-03; norm: 1.497e-01; mom: 3.254e+00;
## best it: 174; best obj: 1.674e+00

## It: 203; obj: 1.721e+00; abs: 1.192e-03; rel: 6.920e-04; norm: 1.502e-01; mom: 3.774e+00;
## best it: 174; best obj: 1.674e+00

## It: 204; obj: 1.705e+00; abs: 1.555e-02; rel: 9.034e-03; norm: 1.502e-01; mom: 3.487e+00;
## best it: 174; best obj: 1.674e+00

## It: 205; obj: 1.692e+00; abs: 1.312e-02; rel: 7.690e-03; norm: 1.492e-01; mom: 3.344e+00;
## best it: 174; best obj: 1.674e+00

## It: 206; obj: 1.682e+00; abs: 1.068e-02; rel: 6.311e-03; norm: 1.495e-01; mom: 3.143e+00;
## best it: 174; best obj: 1.674e+00

## It: 207; obj: 1.689e+00; abs: 7.482e-03; rel: 4.449e-03; norm: 1.494e-01; mom: 3.177e+00;
## best it: 174; best obj: 1.674e+00

## It: 208; obj: 1.679e+00; abs: 9.915e-03; rel: 5.870e-03; norm: 1.498e-01; mom: 3.128e+00;
## best it: 174; best obj: 1.674e+00

## It: 209; obj: 1.672e+00; abs: 6.953e-03; rel: 4.140e-03; norm: 1.485e-01; mom: 3.329e+00;
## best it: 209; best obj: 1.672e+00

## It: 210; obj: 1.690e+00; abs: 1.745e-02; rel: 1.044e-02; norm: 1.495e-01; mom: 2.753e+00;
## best it: 209; best obj: 1.672e+00

## It: 211; obj: 1.697e+00; abs: 6.884e-03; rel: 4.074e-03; norm: 1.498e-01; mom: 3.037e+00;
## best it: 209; best obj: 1.672e+00

## It: 212; obj: 1.701e+00; abs: 4.601e-03; rel: 2.712e-03; norm: 1.509e-01; mom: 3.635e+00;
## best it: 209; best obj: 1.672e+00

## It: 213; obj: 1.714e+00; abs: 1.304e-02; rel: 7.663e-03; norm: 1.511e-01; mom: 3.435e+00;
## best it: 209; best obj: 1.672e+00

## It: 214; obj: 1.701e+00; abs: 1.299e-02; rel: 7.580e-03; norm: 1.493e-01; mom: 3.637e+00;
## best it: 209; best obj: 1.672e+00

## It: 215; obj: 1.697e+00; abs: 4.691e-03; rel: 2.757e-03; norm: 1.495e-01; mom: 3.485e+00;
## best it: 209; best obj: 1.672e+00

## It: 216; obj: 1.752e+00; abs: 5.523e-02; rel: 3.255e-02; norm: 1.513e-01; mom: 3.330e+00;
## best it: 209; best obj: 1.672e+00

## It: 217; obj: 1.738e+00; abs: 1.424e-02; rel: 8.127e-03; norm: 1.506e-01; mom: 3.955e+00;
## best it: 209; best obj: 1.672e+00

## It: 218; obj: 1.704e+00; abs: 3.354e-02; rel: 1.930e-02; norm: 1.502e-01; mom: 4.031e+00;
## best it: 209; best obj: 1.672e+00

## It: 219; obj: 1.719e+00; abs: 1.484e-02; rel: 8.707e-03; norm: 1.504e-01; mom: 3.648e+00;
## best it: 209; best obj: 1.672e+00

## It: 220; obj: 1.727e+00; abs: 7.779e-03; rel: 4.525e-03; norm: 1.510e-01; mom: 3.599e+00;
## best it: 209; best obj: 1.672e+00

## It: 221; obj: 1.717e+00; abs: 9.927e-03; rel: 5.749e-03; norm: 1.505e-01; mom: 3.811e+00;
## best it: 209; best obj: 1.672e+00

## It: 222; obj: 1.714e+00; abs: 2.729e-03; rel: 1.589e-03; norm: 1.517e-01; mom: 3.519e+00;
## best it: 209; best obj: 1.672e+00

## It: 223; obj: 1.716e+00; abs: 1.799e-03; rel: 1.050e-03; norm: 1.501e-01; mom: 3.443e+00;
## best it: 209; best obj: 1.672e+00

## It: 224; obj: 1.716e+00; abs: 4.564e-04; rel: 2.660e-04; norm: 1.504e-01; mom: 3.594e+00;
## best it: 209; best obj: 1.672e+00

## It: 225; obj: 1.730e+00; abs: 1.404e-02; rel: 8.183e-03; norm: 1.507e-01; mom: 3.550e+00;
## best it: 209; best obj: 1.672e+00

## It: 226; obj: 1.735e+00; abs: 5.064e-03; rel: 2.927e-03; norm: 1.514e-01; mom: 3.458e+00;

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## best it: 209; best obj: 1.672e+00
## It: 227; obj: 1.703e+00; abs: 3.287e-02; rel: 1.894e-02; norm: 1.507e-01; mom: 3.558e+00;
## best it: 209; best obj: 1.672e+00
## It: 228; obj: 1.701e+00; abs: 1.038e-03; rel: 6.096e-04; norm: 1.510e-01; mom: 3.531e+00;
## best it: 209; best obj: 1.672e+00
## It: 229; obj: 1.706e+00; abs: 4.576e-03; rel: 2.690e-03; norm: 1.501e-01; mom: 3.105e+00;
## best it: 209; best obj: 1.672e+00
## It: 230; obj: 1.709e+00; abs: 3.437e-03; rel: 2.015e-03; norm: 1.496e-01; mom: 3.308e+00;
## best it: 209; best obj: 1.672e+00
## It: 231; obj: 1.706e+00; abs: 3.629e-03; rel: 2.123e-03; norm: 1.498e-01; mom: 3.544e+00;
## best it: 209; best obj: 1.672e+00
## It: 232; obj: 1.729e+00; abs: 2.282e-02; rel: 1.338e-02; norm: 1.494e-01; mom: 3.174e+00;
## best it: 209; best obj: 1.672e+00
## It: 233; obj: 1.748e+00; abs: 1.910e-02; rel: 1.105e-02; norm: 1.502e-01; mom: 3.357e+00;
## best it: 209; best obj: 1.672e+00
## It: 234; obj: 1.757e+00; abs: 8.946e-03; rel: 5.118e-03; norm: 1.502e-01; mom: 3.688e+00;
## best it: 209; best obj: 1.672e+00
## It: 235; obj: 1.713e+00; abs: 4.412e-02; rel: 2.512e-02; norm: 1.511e-01; mom: 3.838e+00;
## best it: 209; best obj: 1.672e+00
## It: 236; obj: 1.715e+00; abs: 2.161e-03; rel: 1.262e-03; norm: 1.506e-01; mom: 3.683e+00;
## best it: 209; best obj: 1.672e+00
## It: 237; obj: 1.721e+00; abs: 6.211e-03; rel: 3.622e-03; norm: 1.511e-01; mom: 3.754e+00;
## best it: 209; best obj: 1.672e+00
## It: 238; obj: 1.702e+00; abs: 1.944e-02; rel: 1.129e-02; norm: 1.495e-01; mom: 3.684e+00;
## best it: 209; best obj: 1.672e+00
## It: 239; obj: 1.696e+00; abs: 5.519e-03; rel: 3.244e-03; norm: 1.497e-01; mom: 3.335e+00;
## best it: 209; best obj: 1.672e+00
## It: 240; obj: 1.706e+00; abs: 9.969e-03; rel: 5.878e-03; norm: 1.504e-01; mom: 3.314e+00;
## best it: 209; best obj: 1.672e+00
## It: 241; obj: 1.694e+00; abs: 1.213e-02; rel: 7.113e-03; norm: 1.494e-01; mom: 3.512e+00;
## best it: 209; best obj: 1.672e+00
## It: 242; obj: 1.713e+00; abs: 1.874e-02; rel: 1.106e-02; norm: 1.498e-01; mom: 3.063e+00;
## best it: 209; best obj: 1.672e+00
## It: 243; obj: 1.708e+00; abs: 5.027e-03; rel: 2.935e-03; norm: 1.508e-01; mom: 3.309e+00;
## best it: 209; best obj: 1.672e+00
## It: 244; obj: 1.700e+00; abs: 7.529e-03; rel: 4.409e-03; norm: 1.502e-01; mom: 3.538e+00;
## best it: 209; best obj: 1.672e+00
## It: 245; obj: 1.708e+00; abs: 7.984e-03; rel: 4.696e-03; norm: 1.501e-01; mom: 3.148e+00;
## best it: 209; best obj: 1.672e+00
## It: 246; obj: 1.721e+00; abs: 1.312e-02; rel: 7.679e-03; norm: 1.507e-01; mom: 3.335e+00;
## best it: 209; best obj: 1.672e+00
## It: 247; obj: 1.714e+00; abs: 7.224e-03; rel: 4.197e-03; norm: 1.501e-01; mom: 3.543e+00;
## best it: 209; best obj: 1.672e+00
## It: 248; obj: 1.742e+00; abs: 2.845e-02; rel: 1.660e-02; norm: 1.503e-01; mom: 5.547e+00;
## best it: 209; best obj: 1.672e+00
## It: 249; obj: 1.765e+00; abs: 2.298e-02; rel: 1.319e-02; norm: 1.515e-01; mom: 4.879e+00;
## best it: 209; best obj: 1.672e+00
## It: 250; obj: 1.732e+00; abs: 3.329e-02; rel: 1.886e-02; norm: 1.523e-01; mom: 5.736e+00;
## best it: 209; best obj: 1.672e+00
## It: 251; obj: 1.723e+00; abs: 9.320e-03; rel: 5.381e-03; norm: 1.513e-01; mom: 6.104e+00;
## best it: 209; best obj: 1.672e+00
## It: 252; obj: 1.750e+00; abs: 2.777e-02; rel: 1.612e-02; norm: 1.506e-01; mom: 4.864e+00;
## best it: 209; best obj: 1.672e+00

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## It: 253; obj: 1.740e+00; abs: 1.080e-02; rel: 6.171e-03; norm: 1.506e-01; mom: 5.666e+00;
## best it: 209; best obj: 1.672e+00
## It: 254; obj: 1.731e+00; abs: 8.223e-03; rel: 4.727e-03; norm: 1.498e-01; mom: 5.944e+00;
## best it: 209; best obj: 1.672e+00
## It: 255; obj: 1.747e+00; abs: 1.588e-02; rel: 9.173e-03; norm: 1.511e-01; mom: 5.838e+00;
## best it: 209; best obj: 1.672e+00
## It: 256; obj: 1.747e+00; abs: 1.793e-04; rel: 1.026e-04; norm: 1.513e-01; mom: 5.507e+00;
## best it: 209; best obj: 1.672e+00
## It: 257; obj: 1.738e+00; abs: 9.257e-03; rel: 5.298e-03; norm: 1.503e-01; mom: 5.957e+00;
## best it: 209; best obj: 1.672e+00
## It: 258; obj: 1.747e+00; abs: 9.429e-03; rel: 5.425e-03; norm: 1.502e-01; mom: 5.492e+00;
## best it: 209; best obj: 1.672e+00
## It: 259; obj: 1.742e+00; abs: 4.946e-03; rel: 2.831e-03; norm: 1.511e-01; mom: 5.543e+00;
## best it: 209; best obj: 1.672e+00
## It: 260; obj: 1.759e+00; abs: 1.687e-02; rel: 9.683e-03; norm: 1.512e-01; mom: 6.196e+00;
## best it: 209; best obj: 1.672e+00
## It: 261; obj: 1.762e+00; abs: 2.727e-03; rel: 1.550e-03; norm: 1.511e-01; mom: 5.650e+00;
## best it: 209; best obj: 1.672e+00
## It: 262; obj: 1.747e+00; abs: 1.460e-02; rel: 8.283e-03; norm: 1.524e-01; mom: 5.710e+00;
## best it: 209; best obj: 1.672e+00
## It: 263; obj: 1.738e+00; abs: 9.422e-03; rel: 5.392e-03; norm: 1.504e-01; mom: 6.280e+00;
## best it: 209; best obj: 1.672e+00
## It: 264; obj: 1.751e+00; abs: 1.296e-02; rel: 7.457e-03; norm: 1.503e-01; mom: 5.447e+00;
## best it: 209; best obj: 1.672e+00
## It: 265; obj: 1.753e+00; abs: 1.854e-03; rel: 1.059e-03; norm: 1.511e-01; mom: 5.367e+00;
## best it: 209; best obj: 1.672e+00
## It: 266; obj: 1.728e+00; abs: 2.443e-02; rel: 1.394e-02; norm: 1.509e-01; mom: 6.325e+00;
## best it: 209; best obj: 1.672e+00
## It: 267; obj: 1.733e+00; abs: 4.631e-03; rel: 2.679e-03; norm: 1.515e-01; mom: 4.847e+00;
## best it: 209; best obj: 1.672e+00
## It: 268; obj: 1.722e+00; abs: 1.091e-02; rel: 6.296e-03; norm: 1.504e-01; mom: 5.421e+00;
## best it: 209; best obj: 1.672e+00
## It: 269; obj: 1.715e+00; abs: 7.483e-03; rel: 4.345e-03; norm: 1.499e-01; mom: 5.433e+00;
## best it: 209; best obj: 1.672e+00
## It: 270; obj: 1.722e+00; abs: 7.097e-03; rel: 4.139e-03; norm: 1.496e-01; mom: 4.886e+00;
## best it: 209; best obj: 1.672e+00
## It: 271; obj: 1.715e+00; abs: 6.277e-03; rel: 3.646e-03; norm: 1.509e-01; mom: 5.475e+00;
## best it: 209; best obj: 1.672e+00
## It: 272; obj: 1.726e+00; abs: 1.010e-02; rel: 5.889e-03; norm: 1.510e-01; mom: 5.639e+00;
## best it: 209; best obj: 1.672e+00
## It: 273; obj: 1.728e+00; abs: 2.974e-03; rel: 1.723e-03; norm: 1.510e-01; mom: 5.256e+00;
## best it: 209; best obj: 1.672e+00
## It: 274; obj: 1.722e+00; abs: 6.635e-03; rel: 3.839e-03; norm: 1.503e-01; mom: 5.415e+00;
## best it: 209; best obj: 1.672e+00
## It: 275; obj: 1.725e+00; abs: 3.504e-03; rel: 2.035e-03; norm: 1.514e-01; mom: 5.839e+00;
## best it: 209; best obj: 1.672e+00

## It: 276; obj: 1.715e+00; abs: 1.044e-02; rel: 6.050e-03; norm: 1.508e-01; mom: 5.131e+00;
## best it: 209; best obj: 1.672e+00
## It: 277; obj: 1.726e+00; abs: 1.151e-02; rel: 6.714e-03; norm: 1.500e-01; mom: 5.495e+00;
## best it: 209; best obj: 1.672e+00
## It: 278; obj: 1.728e+00; abs: 1.691e-03; rel: 9.795e-04; norm: 1.497e-01; mom: 5.419e+00;
## best it: 209; best obj: 1.672e+00
## It: 279; obj: 1.709e+00; abs: 1.948e-02; rel: 1.127e-02; norm: 1.513e-01; mom: 5.209e+00;

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## best it: 209; best obj: 1.672e+00
## It: 280; obj: 1.716e+00; abs: 7.102e-03; rel: 4.157e-03; norm: 1.506e-01; mom: 5.493e+00;
## best it: 209; best obj: 1.672e+00
## It: 281; obj: 1.720e+00; abs: 4.187e-03; rel: 2.440e-03; norm: 1.501e-01; mom: 5.019e+00;
## best it: 209; best obj: 1.672e+00
## It: 282; obj: 1.705e+00; abs: 1.484e-02; rel: 8.627e-03; norm: 1.506e-01; mom: 5.400e+00;
## best it: 209; best obj: 1.672e+00
## It: 283; obj: 1.709e+00; abs: 3.475e-03; rel: 2.038e-03; norm: 1.500e-01; mom: 4.808e+00;
## best it: 209; best obj: 1.672e+00
## It: 284; obj: 1.720e+00; abs: 1.182e-02; rel: 6.916e-03; norm: 1.502e-01; mom: 5.172e+00;
## best it: 209; best obj: 1.672e+00
## It: 285; obj: 1.720e+00; abs: 2.410e-04; rel: 1.401e-04; norm: 1.511e-01; mom: 4.940e+00;
## best it: 209; best obj: 1.672e+00
## It: 286; obj: 1.707e+00; abs: 1.329e-02; rel: 7.728e-03; norm: 1.512e-01; mom: 5.415e+00;
## best it: 209; best obj: 1.672e+00
## It: 287; obj: 1.704e+00; abs: 2.876e-03; rel: 1.685e-03; norm: 1.505e-01; mom: 5.337e+00;
## best it: 209; best obj: 1.672e+00
## It: 288; obj: 1.715e+00; abs: 1.057e-02; rel: 6.201e-03; norm: 1.507e-01; mom: 4.815e+00;
## best it: 209; best obj: 1.672e+00
## It: 289; obj: 1.717e+00; abs: 2.432e-03; rel: 1.419e-03; norm: 1.497e-01; mom: 5.252e+00;
## best it: 209; best obj: 1.672e+00
## It: 290; obj: 1.717e+00; abs: 2.981e-04; rel: 1.736e-04; norm: 1.501e-01; mom: 5.069e+00;
## best it: 209; best obj: 1.672e+00
## It: 291; obj: 1.721e+00; abs: 3.839e-03; rel: 2.235e-03; norm: 1.507e-01; mom: 4.953e+00;
## best it: 209; best obj: 1.672e+00
## It: 292; obj: 1.716e+00; abs: 4.626e-03; rel: 2.688e-03; norm: 1.504e-01; mom: 5.506e+00;
## best it: 209; best obj: 1.672e+00
## It: 293; obj: 1.709e+00; abs: 7.194e-03; rel: 4.191e-03; norm: 1.505e-01; mom: 5.342e+00;
## best it: 209; best obj: 1.672e+00
## It: 294; obj: 1.700e+00; abs: 8.929e-03; rel: 5.224e-03; norm: 1.513e-01; mom: 4.928e+00;
## best it: 209; best obj: 1.672e+00
## It: 295; obj: 1.723e+00; abs: 2.307e-02; rel: 1.356e-02; norm: 1.505e-01; mom: 5.036e+00;
## best it: 209; best obj: 1.672e+00
## It: 296; obj: 1.715e+00; abs: 8.750e-03; rel: 5.077e-03; norm: 1.496e-01; mom: 5.165e+00;
## best it: 209; best obj: 1.672e+00
## It: 297; obj: 1.706e+00; abs: 8.389e-03; rel: 4.892e-03; norm: 1.504e-01; mom: 5.156e+00;
## best it: 209; best obj: 1.672e+00
## It: 298; obj: 1.719e+00; abs: 1.236e-02; rel: 7.242e-03; norm: 1.508e-01; mom: 4.983e+00;
## best it: 209; best obj: 1.672e+00
## It: 299; obj: 1.734e+00; abs: 1.547e-02; rel: 9.001e-03; norm: 1.497e-01; mom: 5.220e+00;
## best it: 209; best obj: 1.672e+00
## It: 300; obj: 1.728e+00; abs: 5.948e-03; rel: 3.430e-03; norm: 1.502e-01; mom: 4.932e+00;
## best it: 209; best obj: 1.672e+00

## It: 301; obj: 1.710e+00; abs: 1.812e-02; rel: 1.048e-02; norm: 1.505e-01; mom: 5.522e+00;
## best it: 209; best obj: 1.672e+00
## It: 302; obj: 1.727e+00; abs: 1.666e-02; rel: 9.742e-03; norm: 1.504e-01; mom: 5.918e+00;
## best it: 209; best obj: 1.672e+00
## It: 303; obj: 1.729e+00; abs: 2.439e-03; rel: 1.412e-03; norm: 1.508e-01; mom: 5.211e+00;
## best it: 209; best obj: 1.672e+00
## It: 304; obj: 1.708e+00; abs: 2.112e-02; rel: 1.222e-02; norm: 1.503e-01; mom: 5.408e+00;
## best it: 209; best obj: 1.672e+00
## It: 305; obj: 1.708e+00; abs: 7.062e-05; rel: 4.135e-05; norm: 1.504e-01; mom: 5.593e+00;
## best it: 209; best obj: 1.672e+00

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## It: 306; obj: 1.714e+00; abs: 5.849e-03; rel: 3.424e-03; norm: 1.499e-01; mom: 4.846e+00;
## best it: 209; best obj: 1.672e+00
## It: 307; obj: 1.716e+00; abs: 2.415e-03; rel: 1.409e-03; norm: 1.502e-01; mom: 5.007e+00;
## best it: 209; best obj: 1.672e+00
## It: 308; obj: 1.713e+00; abs: 3.681e-03; rel: 2.145e-03; norm: 1.505e-01; mom: 5.437e+00;
## best it: 209; best obj: 1.672e+00
## It: 309; obj: 1.716e+00; abs: 3.069e-03; rel: 1.792e-03; norm: 1.491e-01; mom: 4.965e+00;
## best it: 209; best obj: 1.672e+00
## It: 310; obj: 1.718e+00; abs: 1.876e-03; rel: 1.093e-03; norm: 1.505e-01; mom: 5.124e+00;
## best it: 209; best obj: 1.672e+00
## It: 311; obj: 1.728e+00; abs: 1.048e-02; rel: 6.101e-03; norm: 1.513e-01; mom: 5.466e+00;
## best it: 209; best obj: 1.672e+00
## It: 312; obj: 1.727e+00; abs: 6.387e-04; rel: 3.696e-04; norm: 1.498e-01; mom: 5.553e+00;
## best it: 209; best obj: 1.672e+00
## It: 313; obj: 1.717e+00; abs: 1.093e-02; rel: 6.327e-03; norm: 1.491e-01; mom: 5.755e+00;
## best it: 209; best obj: 1.672e+00
## It: 314; obj: 1.716e+00; abs: 8.570e-04; rel: 4.993e-04; norm: 1.501e-01; mom: 5.449e+00;
## best it: 209; best obj: 1.672e+00
## It: 315; obj: 1.726e+00; abs: 9.992e-03; rel: 5.824e-03; norm: 1.507e-01; mom: 5.496e+00;
## best it: 209; best obj: 1.672e+00
## It: 316; obj: 1.727e+00; abs: 8.444e-04; rel: 4.893e-04; norm: 1.502e-01; mom: 5.319e+00;
## best it: 209; best obj: 1.672e+00
## It: 317; obj: 1.719e+00; abs: 7.309e-03; rel: 4.233e-03; norm: 1.502e-01; mom: 5.525e+00;
## best it: 209; best obj: 1.672e+00
## It: 318; obj: 1.709e+00; abs: 1.063e-02; rel: 6.182e-03; norm: 1.496e-01; mom: 5.224e+00;
## best it: 209; best obj: 1.672e+00
## It: 319; obj: 1.724e+00; abs: 1.513e-02; rel: 8.854e-03; norm: 1.498e-01; mom: 5.093e+00;
## best it: 209; best obj: 1.672e+00
## It: 320; obj: 1.735e+00; abs: 1.104e-02; rel: 6.406e-03; norm: 1.513e-01; mom: 5.665e+00;
## best it: 209; best obj: 1.672e+00
## It: 321; obj: 1.718e+00; abs: 1.660e-02; rel: 9.570e-03; norm: 1.505e-01; mom: 5.459e+00;
## best it: 209; best obj: 1.672e+00
## It: 322; obj: 1.714e+00; abs: 3.677e-03; rel: 2.140e-03; norm: 1.501e-01; mom: 5.623e+00;
## best it: 209; best obj: 1.672e+00
## It: 323; obj: 1.722e+00; abs: 7.054e-03; rel: 4.114e-03; norm: 1.501e-01; mom: 5.393e+00;
## best it: 209; best obj: 1.672e+00
## It: 324; obj: 1.705e+00; abs: 1.628e-02; rel: 9.458e-03; norm: 1.508e-01; mom: 5.194e+00;
## best it: 209; best obj: 1.672e+00
## It: 325; obj: 1.710e+00; abs: 5.042e-03; rel: 2.957e-03; norm: 1.501e-01; mom: 5.030e+00;
## best it: 209; best obj: 1.672e+00

## It: 326; obj: 1.726e+00; abs: 1.598e-02; rel: 9.344e-03; norm: 1.507e-01; mom: 5.069e+00;
## best it: 209; best obj: 1.672e+00
## It: 327; obj: 1.725e+00; abs: 1.662e-03; rel: 9.629e-04; norm: 1.502e-01; mom: 5.186e+00;
## best it: 209; best obj: 1.672e+00
## It: 328; obj: 1.714e+00; abs: 1.056e-02; rel: 6.122e-03; norm: 1.507e-01; mom: 5.217e+00;
## best it: 209; best obj: 1.672e+00
## It: 329; obj: 1.727e+00; abs: 1.339e-02; rel: 7.811e-03; norm: 1.512e-01; mom: 5.306e+00;
## best it: 209; best obj: 1.672e+00
## It: 330; obj: 1.746e+00; abs: 1.858e-02; rel: 1.075e-02; norm: 1.513e-01; mom: 5.152e+00;
## best it: 209; best obj: 1.672e+00
## It: 331; obj: 1.730e+00; abs: 1.576e-02; rel: 9.028e-03; norm: 1.502e-01; mom: 5.658e+00;
## best it: 209; best obj: 1.672e+00
## It: 332; obj: 1.731e+00; abs: 7.872e-04; rel: 4.550e-04; norm: 1.514e-01; mom: 6.031e+00;

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## best it: 209; best obj: 1.672e+00
## It: 333; obj: 1.743e+00; abs: 1.148e-02; rel: 6.630e-03; norm: 1.515e-01; mom: 4.903e+00;
## best it: 209; best obj: 1.672e+00
## It: 334; obj: 1.718e+00; abs: 2.427e-02; rel: 1.393e-02; norm: 1.507e-01; mom: 5.941e+00;
## best it: 209; best obj: 1.672e+00
## It: 335; obj: 1.706e+00; abs: 1.270e-02; rel: 7.390e-03; norm: 1.507e-01; mom: 5.662e+00;
## best it: 209; best obj: 1.672e+00
## It: 336; obj: 1.717e+00; abs: 1.181e-02; rel: 6.925e-03; norm: 1.504e-01; mom: 4.907e+00;
## best it: 209; best obj: 1.672e+00
## It: 337; obj: 1.710e+00; abs: 7.757e-03; rel: 4.517e-03; norm: 1.496e-01; mom: 5.444e+00;
## best it: 209; best obj: 1.672e+00
## It: 338; obj: 1.713e+00; abs: 3.680e-03; rel: 2.153e-03; norm: 1.493e-01; mom: 5.201e+00;
## best it: 209; best obj: 1.672e+00
## It: 339; obj: 1.706e+00; abs: 7.394e-03; rel: 4.316e-03; norm: 1.504e-01; mom: 4.978e+00;
## best it: 209; best obj: 1.672e+00
## It: 340; obj: 1.696e+00; abs: 9.414e-03; rel: 5.519e-03; norm: 1.493e-01; mom: 5.764e+00;
## best it: 209; best obj: 1.672e+00
## It: 341; obj: 1.709e+00; abs: 1.244e-02; rel: 7.335e-03; norm: 1.490e-01; mom: 5.514e+00;
## best it: 209; best obj: 1.672e+00
## It: 342; obj: 1.728e+00; abs: 1.941e-02; rel: 1.136e-02; norm: 1.503e-01; mom: 5.006e+00;
## best it: 209; best obj: 1.672e+00
## It: 343; obj: 1.707e+00; abs: 2.092e-02; rel: 1.210e-02; norm: 1.511e-01; mom: 5.845e+00;
## best it: 209; best obj: 1.672e+00
## It: 344; obj: 1.705e+00; abs: 2.519e-03; rel: 1.475e-03; norm: 1.496e-01; mom: 6.151e+00;
## best it: 209; best obj: 1.672e+00
## It: 345; obj: 1.713e+00; abs: 8.444e-03; rel: 4.953e-03; norm: 1.508e-01; mom: 4.864e+00;
## best it: 209; best obj: 1.672e+00
## It: 346; obj: 1.712e+00; abs: 1.829e-03; rel: 1.068e-03; norm: 1.514e-01; mom: 5.813e+00;
## best it: 209; best obj: 1.672e+00
## It: 347; obj: 1.720e+00; abs: 8.502e-03; rel: 4.968e-03; norm: 1.495e-01; mom: 5.680e+00;
## best it: 209; best obj: 1.672e+00
## It: 348; obj: 1.739e+00; abs: 1.881e-02; rel: 1.094e-02; norm: 1.523e-01; mom: 4.883e+00;
## best it: 209; best obj: 1.672e+00
## It: 349; obj: 1.723e+00; abs: 1.563e-02; rel: 8.987e-03; norm: 1.508e-01; mom: 6.106e+00;
## best it: 209; best obj: 1.672e+00
## It: 350; obj: 1.713e+00; abs: 1.063e-02; rel: 6.170e-03; norm: 1.500e-01; mom: 5.669e+00;
## best it: 209; best obj: 1.672e+00

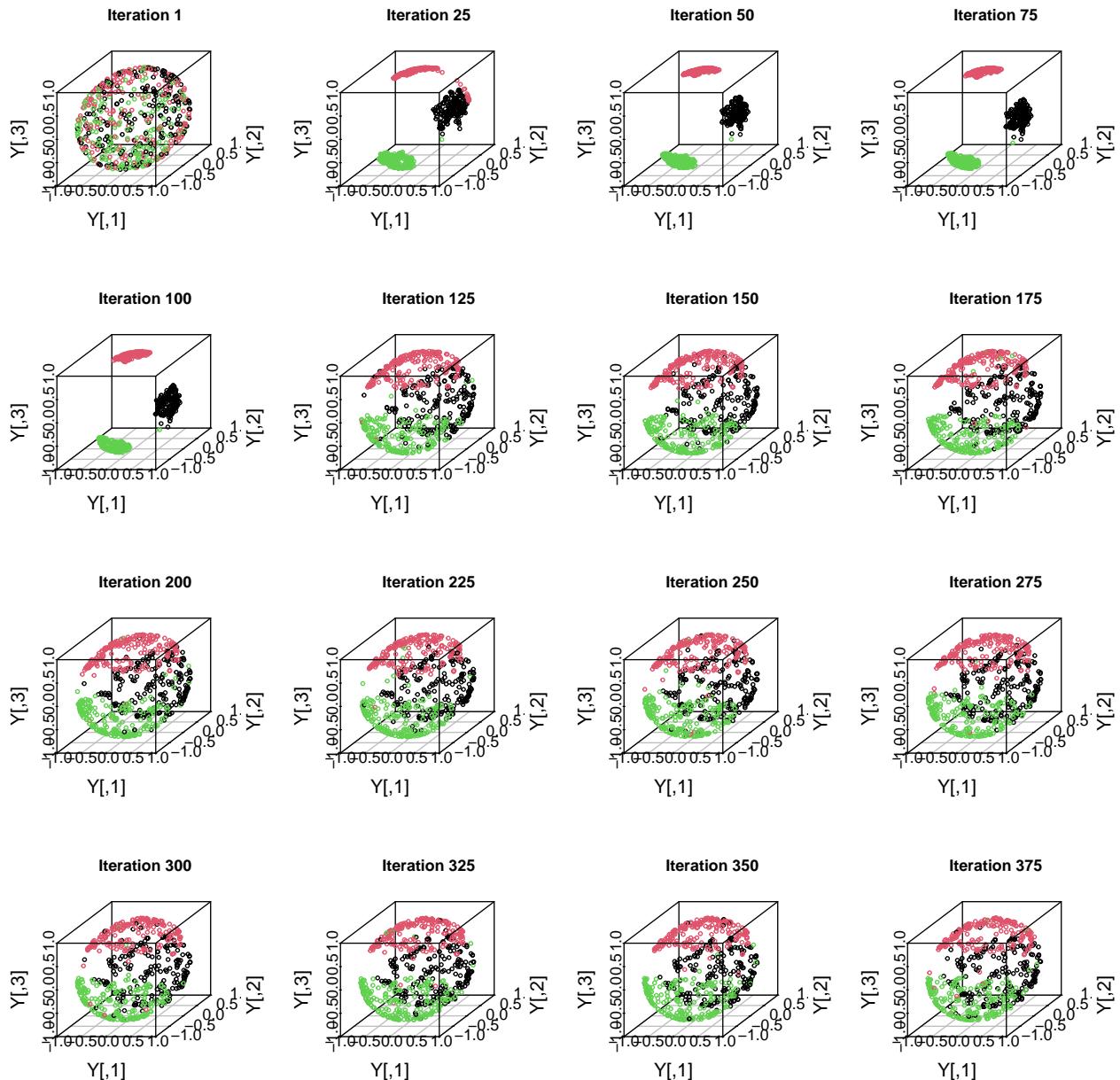
## It: 351; obj: 1.729e+00; abs: 1.657e-02; rel: 9.676e-03; norm: 1.509e-01; mom: 5.306e+00;
## best it: 209; best obj: 1.672e+00
## It: 352; obj: 1.702e+00; abs: 2.706e-02; rel: 1.565e-02; norm: 1.510e-01; mom: 5.403e+00;
## best it: 209; best obj: 1.672e+00
## It: 353; obj: 1.702e+00; abs: 3.763e-04; rel: 2.211e-04; norm: 1.502e-01; mom: 5.300e+00;
## best it: 209; best obj: 1.672e+00
## It: 354; obj: 1.720e+00; abs: 1.858e-02; rel: 1.092e-02; norm: 1.502e-01; mom: 4.738e+00;
## best it: 209; best obj: 1.672e+00
## It: 355; obj: 1.716e+00; abs: 4.448e-03; rel: 2.586e-03; norm: 1.504e-01; mom: 5.353e+00;
## best it: 209; best obj: 1.672e+00
## It: 356; obj: 1.728e+00; abs: 1.218e-02; rel: 7.098e-03; norm: 1.495e-01; mom: 5.167e+00;
## best it: 209; best obj: 1.672e+00
## It: 357; obj: 1.731e+00; abs: 2.738e-03; rel: 1.584e-03; norm: 1.517e-01; mom: 5.659e+00;
## best it: 209; best obj: 1.672e+00
## It: 358; obj: 1.722e+00; abs: 8.505e-03; rel: 4.914e-03; norm: 1.503e-01; mom: 5.529e+00;
## best it: 209; best obj: 1.672e+00

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## It: 359; obj: 1.719e+00; abs: 3.607e-03; rel: 2.094e-03; norm: 1.496e-01; mom: 5.463e+00;
## best it: 209; best obj: 1.672e+00
## It: 360; obj: 1.723e+00; abs: 3.987e-03; rel: 2.320e-03; norm: 1.507e-01; mom: 5.380e+00;
## best it: 209; best obj: 1.672e+00
## It: 361; obj: 1.737e+00; abs: 1.427e-02; rel: 8.284e-03; norm: 1.506e-01; mom: 4.930e+00;
## best it: 209; best obj: 1.672e+00
## It: 362; obj: 1.717e+00; abs: 2.026e-02; rel: 1.167e-02; norm: 1.502e-01; mom: 5.581e+00;
## best it: 209; best obj: 1.672e+00
## It: 363; obj: 1.712e+00; abs: 4.859e-03; rel: 2.830e-03; norm: 1.498e-01; mom: 5.774e+00;
## best it: 209; best obj: 1.672e+00
## It: 364; obj: 1.721e+00; abs: 9.322e-03; rel: 5.446e-03; norm: 1.499e-01; mom: 4.891e+00;
## best it: 209; best obj: 1.672e+00
## It: 365; obj: 1.729e+00; abs: 7.718e-03; rel: 4.484e-03; norm: 1.502e-01; mom: 5.573e+00;
## best it: 209; best obj: 1.672e+00
## It: 366; obj: 1.729e+00; abs: 5.953e-04; rel: 3.443e-04; norm: 1.503e-01; mom: 5.643e+00;
## best it: 209; best obj: 1.672e+00
## It: 367; obj: 1.717e+00; abs: 1.251e-02; rel: 7.236e-03; norm: 1.493e-01; mom: 5.189e+00;
## best it: 209; best obj: 1.672e+00
## It: 368; obj: 1.712e+00; abs: 4.853e-03; rel: 2.827e-03; norm: 1.503e-01; mom: 5.620e+00;
## best it: 209; best obj: 1.672e+00
## It: 369; obj: 1.726e+00; abs: 1.427e-02; rel: 8.333e-03; norm: 1.512e-01; mom: 5.403e+00;
## best it: 209; best obj: 1.672e+00
## It: 370; obj: 1.722e+00; abs: 4.271e-03; rel: 2.474e-03; norm: 1.500e-01; mom: 5.208e+00;
## best it: 209; best obj: 1.672e+00
## It: 371; obj: 1.741e+00; abs: 1.913e-02; rel: 1.111e-02; norm: 1.493e-01; mom: 5.356e+00;
## best it: 209; best obj: 1.672e+00
## It: 372; obj: 1.737e+00; abs: 4.591e-03; rel: 2.637e-03; norm: 1.506e-01; mom: 5.820e+00;
## best it: 209; best obj: 1.672e+00
## It: 373; obj: 1.718e+00; abs: 1.863e-02; rel: 1.073e-02; norm: 1.496e-01; mom: 5.606e+00;
## best it: 209; best obj: 1.672e+00
## It: 374; obj: 1.724e+00; abs: 6.245e-03; rel: 3.635e-03; norm: 1.511e-01; mom: 4.890e+00;
## best it: 209; best obj: 1.672e+00
## It: 375; obj: 1.736e+00; abs: 1.158e-02; rel: 6.716e-03; norm: 1.504e-01; mom: 6.118e+00;
## best it: 209; best obj: 1.672e+00

```



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## It: 376; obj: 1.731e+00; abs: 4.646e-03; rel: 2.677e-03; norm: 1.502e-01; mom: 5.246e+00;
## best it: 209; best obj: 1.672e+00
## It: 377; obj: 1.731e+00; abs: 3.200e-04; rel: 1.848e-04; norm: 1.503e-01; mom: 5.555e+00;
## best it: 209; best obj: 1.672e+00
## It: 378; obj: 1.728e+00; abs: 2.672e-03; rel: 1.544e-03; norm: 1.507e-01; mom: 5.694e+00;
## best it: 209; best obj: 1.672e+00
## It: 379; obj: 1.723e+00; abs: 4.970e-03; rel: 2.876e-03; norm: 1.493e-01; mom: 5.768e+00;
## best it: 209; best obj: 1.672e+00
## It: 380; obj: 1.721e+00; abs: 2.399e-03; rel: 1.392e-03; norm: 1.504e-01; mom: 4.957e+00;
## best it: 209; best obj: 1.672e+00
## It: 381; obj: 1.731e+00; abs: 1.032e-02; rel: 5.999e-03; norm: 1.512e-01; mom: 5.708e+00;
## best it: 209; best obj: 1.672e+00
## It: 382; obj: 1.712e+00; abs: 1.863e-02; rel: 1.076e-02; norm: 1.501e-01; mom: 5.349e+00;
## best it: 209; best obj: 1.672e+00
## It: 383; obj: 1.699e+00; abs: 1.389e-02; rel: 8.114e-03; norm: 1.500e-01; mom: 5.416e+00;

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## best it: 209; best obj: 1.672e+00
## It: 384; obj: 1.700e+00; abs: 1.046e-03; rel: 6.156e-04; norm: 1.503e-01; mom: 5.512e+00;
## best it: 209; best obj: 1.672e+00
## It: 385; obj: 1.720e+00; abs: 2.030e-02; rel: 1.194e-02; norm: 1.501e-01; mom: 5.032e+00;
## best it: 209; best obj: 1.672e+00
## It: 386; obj: 1.705e+00; abs: 1.533e-02; rel: 8.915e-03; norm: 1.493e-01; mom: 5.028e+00;
## best it: 209; best obj: 1.672e+00
## It: 387; obj: 1.694e+00; abs: 1.077e-02; rel: 6.319e-03; norm: 1.509e-01; mom: 5.409e+00;
## best it: 209; best obj: 1.672e+00
## It: 388; obj: 1.709e+00; abs: 1.512e-02; rel: 8.928e-03; norm: 1.502e-01; mom: 4.949e+00;
## best it: 209; best obj: 1.672e+00
## It: 389; obj: 1.712e+00; abs: 2.800e-03; rel: 1.639e-03; norm: 1.501e-01; mom: 4.949e+00;
## best it: 209; best obj: 1.672e+00
## It: 390; obj: 1.708e+00; abs: 3.872e-03; rel: 2.262e-03; norm: 1.507e-01; mom: 5.268e+00;
## best it: 209; best obj: 1.672e+00
## It: 391; obj: 1.728e+00; abs: 1.981e-02; rel: 1.160e-02; norm: 1.499e-01; mom: 5.207e+00;
## best it: 209; best obj: 1.672e+00
## It: 392; obj: 1.710e+00; abs: 1.767e-02; rel: 1.023e-02; norm: 1.515e-01; mom: 5.102e+00;
## best it: 209; best obj: 1.672e+00
## It: 393; obj: 1.702e+00; abs: 7.515e-03; rel: 4.395e-03; norm: 1.503e-01; mom: 5.848e+00;
## best it: 209; best obj: 1.672e+00
## It: 394; obj: 1.716e+00; abs: 1.382e-02; rel: 8.120e-03; norm: 1.498e-01; mom: 4.599e+00;
## best it: 209; best obj: 1.672e+00
## It: 395; obj: 1.729e+00; abs: 1.300e-02; rel: 7.572e-03; norm: 1.502e-01; mom: 4.971e+00;
## best it: 209; best obj: 1.672e+00
## It: 396; obj: 1.726e+00; abs: 3.545e-03; rel: 2.050e-03; norm: 1.504e-01; mom: 5.683e+00;
## best it: 209; best obj: 1.672e+00
## It: 397; obj: 1.730e+00; abs: 3.956e-03; rel: 2.292e-03; norm: 1.510e-01; mom: 5.304e+00;
## best it: 209; best obj: 1.672e+00
## It: 398; obj: 1.726e+00; abs: 3.619e-03; rel: 2.092e-03; norm: 1.503e-01; mom: 5.332e+00;
## best it: 209; best obj: 1.672e+00
## It: 399; obj: 1.709e+00; abs: 1.679e-02; rel: 9.728e-03; norm: 1.510e-01; mom: 5.896e+00;
## best it: 209; best obj: 1.672e+00
## It: 400; obj: 1.715e+00; abs: 5.391e-03; rel: 3.154e-03; norm: 1.500e-01; mom: 4.825e+00;
## best it: 209; best obj: 1.672e+00

## It: 401; obj: 1.722e+00; abs: 7.479e-03; rel: 4.362e-03; norm: 1.503e-01; mom: 5.162e+00;
## best it: 209; best obj: 1.672e+00
## It: 402; obj: 1.713e+00; abs: 8.981e-03; rel: 5.215e-03; norm: 1.518e-01; mom: 5.674e+00;
## best it: 209; best obj: 1.672e+00
## It: 403; obj: 1.731e+00; abs: 1.759e-02; rel: 1.027e-02; norm: 1.500e-01; mom: 5.444e+00;
## best it: 209; best obj: 1.672e+00
## It: 404; obj: 1.741e+00; abs: 9.899e-03; rel: 5.720e-03; norm: 1.501e-01; mom: 4.941e+00;
## best it: 209; best obj: 1.672e+00
## It: 405; obj: 1.740e+00; abs: 6.482e-04; rel: 3.724e-04; norm: 1.500e-01; mom: 5.966e+00;
## best it: 209; best obj: 1.672e+00
## It: 406; obj: 1.720e+00; abs: 2.011e-02; rel: 1.156e-02; norm: 1.507e-01; mom: 5.725e+00;
## best it: 209; best obj: 1.672e+00
## It: 407; obj: 1.718e+00; abs: 1.560e-03; rel: 9.072e-04; norm: 1.498e-01; mom: 5.387e+00;
## best it: 209; best obj: 1.672e+00
## It: 408; obj: 1.714e+00; abs: 4.565e-03; rel: 2.657e-03; norm: 1.496e-01; mom: 5.286e+00;
## best it: 209; best obj: 1.672e+00
## It: 409; obj: 1.715e+00; abs: 1.100e-03; rel: 6.420e-04; norm: 1.494e-01; mom: 5.031e+00;
## best it: 209; best obj: 1.672e+00

```

```

## It: 410; obj: 1.712e+00; abs: 2.505e-03; rel: 1.461e-03; norm: 1.492e-01; mom: 5.183e+00;
## best it: 209; best obj: 1.672e+00
## It: 411; obj: 1.729e+00; abs: 1.640e-02; rel: 9.576e-03; norm: 1.503e-01; mom: 5.136e+00;
## best it: 209; best obj: 1.672e+00
## It: 412; obj: 1.734e+00; abs: 4.798e-03; rel: 2.775e-03; norm: 1.503e-01; mom: 5.274e+00;
## best it: 209; best obj: 1.672e+00
## It: 413; obj: 1.715e+00; abs: 1.878e-02; rel: 1.083e-02; norm: 1.503e-01; mom: 5.392e+00;
## best it: 209; best obj: 1.672e+00
## It: 414; obj: 1.710e+00; abs: 5.231e-03; rel: 3.051e-03; norm: 1.510e-01; mom: 5.542e+00;
## best it: 209; best obj: 1.672e+00
## It: 415; obj: 1.709e+00; abs: 9.809e-04; rel: 5.738e-04; norm: 1.503e-01; mom: 5.040e+00;
## best it: 209; best obj: 1.672e+00
## It: 416; obj: 1.716e+00; abs: 6.971e-03; rel: 4.080e-03; norm: 1.512e-01; mom: 4.985e+00;
## best it: 209; best obj: 1.672e+00
## It: 417; obj: 1.700e+00; abs: 1.520e-02; rel: 8.857e-03; norm: 1.517e-01; mom: 5.197e+00;
## best it: 209; best obj: 1.672e+00
## It: 418; obj: 1.703e+00; abs: 3.066e-03; rel: 1.803e-03; norm: 1.508e-01; mom: 5.331e+00;
## best it: 209; best obj: 1.672e+00
## It: 419; obj: 1.709e+00; abs: 5.134e-03; rel: 3.014e-03; norm: 1.495e-01; mom: 5.173e+00;
## best it: 209; best obj: 1.672e+00
## It: 420; obj: 1.731e+00; abs: 2.249e-02; rel: 1.316e-02; norm: 1.501e-01; mom: 5.276e+00;
## best it: 209; best obj: 1.672e+00
## It: 421; obj: 1.723e+00; abs: 8.439e-03; rel: 4.875e-03; norm: 1.501e-01; mom: 5.350e+00;
## best it: 209; best obj: 1.672e+00
## It: 422; obj: 1.703e+00; abs: 1.998e-02; rel: 1.160e-02; norm: 1.512e-01; mom: 5.411e+00;
## best it: 209; best obj: 1.672e+00
## It: 423; obj: 1.706e+00; abs: 3.494e-03; rel: 2.052e-03; norm: 1.513e-01; mom: 5.457e+00;
## best it: 209; best obj: 1.672e+00
## It: 424; obj: 1.715e+00; abs: 8.878e-03; rel: 5.203e-03; norm: 1.493e-01; mom: 4.754e+00;
## best it: 209; best obj: 1.672e+00
## It: 425; obj: 1.721e+00; abs: 6.387e-03; rel: 3.724e-03; norm: 1.498e-01; mom: 5.027e+00;
## best it: 209; best obj: 1.672e+00

## It: 426; obj: 1.732e+00; abs: 1.055e-02; rel: 6.128e-03; norm: 1.497e-01; mom: 5.530e+00;
## best it: 209; best obj: 1.672e+00
## It: 427; obj: 1.717e+00; abs: 1.487e-02; rel: 8.587e-03; norm: 1.512e-01; mom: 5.185e+00;
## best it: 209; best obj: 1.672e+00
## It: 428; obj: 1.700e+00; abs: 1.722e-02; rel: 1.003e-02; norm: 1.504e-01; mom: 5.545e+00;
## best it: 209; best obj: 1.672e+00
## It: 429; obj: 1.726e+00; abs: 2.661e-02; rel: 1.566e-02; norm: 1.509e-01; mom: 4.947e+00;
## best it: 209; best obj: 1.672e+00
## It: 430; obj: 1.725e+00; abs: 1.155e-03; rel: 6.690e-04; norm: 1.498e-01; mom: 5.370e+00;
## best it: 209; best obj: 1.672e+00
## It: 431; obj: 1.723e+00; abs: 1.832e-03; rel: 1.062e-03; norm: 1.508e-01; mom: 5.356e+00;
## best it: 209; best obj: 1.672e+00
## It: 432; obj: 1.731e+00; abs: 7.533e-03; rel: 4.371e-03; norm: 1.509e-01; mom: 5.712e+00;
## best it: 209; best obj: 1.672e+00
## It: 433; obj: 1.724e+00; abs: 6.937e-03; rel: 4.007e-03; norm: 1.515e-01; mom: 5.349e+00;
## best it: 209; best obj: 1.672e+00
## It: 434; obj: 1.706e+00; abs: 1.771e-02; rel: 1.027e-02; norm: 1.501e-01; mom: 5.507e+00;
## best it: 209; best obj: 1.672e+00
## It: 435; obj: 1.715e+00; abs: 8.902e-03; rel: 5.217e-03; norm: 1.501e-01; mom: 5.333e+00;
## best it: 209; best obj: 1.672e+00
## It: 436; obj: 1.729e+00; abs: 1.341e-02; rel: 7.819e-03; norm: 1.508e-01; mom: 5.383e+00;

```

```

## best it: 209; best obj: 1.672e+00
## It: 437; obj: 1.707e+00; abs: 2.151e-02; rel: 1.244e-02; norm: 1.509e-01; mom: 5.062e+00;
## best it: 209; best obj: 1.672e+00
## It: 438; obj: 1.719e+00; abs: 1.173e-02; rel: 6.874e-03; norm: 1.513e-01; mom: 5.575e+00;
## best it: 209; best obj: 1.672e+00
## It: 439; obj: 1.733e+00; abs: 1.436e-02; rel: 8.354e-03; norm: 1.505e-01; mom: 4.902e+00;
## best it: 209; best obj: 1.672e+00
## It: 440; obj: 1.725e+00; abs: 7.946e-03; rel: 4.584e-03; norm: 1.508e-01; mom: 5.324e+00;
## best it: 209; best obj: 1.672e+00
## It: 441; obj: 1.734e+00; abs: 8.425e-03; rel: 4.883e-03; norm: 1.509e-01; mom: 5.574e+00;
## best it: 209; best obj: 1.672e+00
## It: 442; obj: 1.729e+00; abs: 5.002e-03; rel: 2.885e-03; norm: 1.516e-01; mom: 5.402e+00;
## best it: 209; best obj: 1.672e+00
## It: 443; obj: 1.730e+00; abs: 1.158e-03; rel: 6.699e-04; norm: 1.506e-01; mom: 5.730e+00;
## best it: 209; best obj: 1.672e+00
## It: 444; obj: 1.736e+00; abs: 6.467e-03; rel: 3.738e-03; norm: 1.516e-01; mom: 5.641e+00;
## best it: 209; best obj: 1.672e+00
## It: 445; obj: 1.725e+00; abs: 1.168e-02; rel: 6.727e-03; norm: 1.501e-01; mom: 5.633e+00;
## best it: 209; best obj: 1.672e+00
## It: 446; obj: 1.737e+00; abs: 1.269e-02; rel: 7.361e-03; norm: 1.498e-01; mom: 5.404e+00;
## best it: 209; best obj: 1.672e+00
## It: 447; obj: 1.738e+00; abs: 2.233e-04; rel: 1.285e-04; norm: 1.506e-01; mom: 5.508e+00;
## best it: 209; best obj: 1.672e+00
## It: 448; obj: 1.721e+00; abs: 1.619e-02; rel: 9.315e-03; norm: 1.503e-01; mom: 5.908e+00;
## best it: 209; best obj: 1.672e+00
## It: 449; obj: 1.727e+00; abs: 5.153e-03; rel: 2.994e-03; norm: 1.501e-01; mom: 5.337e+00;
## best it: 209; best obj: 1.672e+00
## It: 450; obj: 1.737e+00; abs: 1.083e-02; rel: 6.273e-03; norm: 1.507e-01; mom: 5.557e+00;
## best it: 209; best obj: 1.672e+00

## It: 451; obj: 1.741e+00; abs: 3.714e-03; rel: 2.137e-03; norm: 1.512e-01; mom: 5.973e+00;
## best it: 209; best obj: 1.672e+00
## It: 452; obj: 1.727e+00; abs: 1.374e-02; rel: 7.894e-03; norm: 1.514e-01; mom: 5.477e+00;
## best it: 209; best obj: 1.672e+00
## It: 453; obj: 1.730e+00; abs: 2.573e-03; rel: 1.489e-03; norm: 1.505e-01; mom: 5.955e+00;
## best it: 209; best obj: 1.672e+00
## It: 454; obj: 1.737e+00; abs: 6.745e-03; rel: 3.899e-03; norm: 1.501e-01; mom: 5.315e+00;
## best it: 209; best obj: 1.672e+00
## It: 455; obj: 1.724e+00; abs: 1.247e-02; rel: 7.180e-03; norm: 1.502e-01; mom: 5.478e+00;
## best it: 209; best obj: 1.672e+00
## It: 456; obj: 1.727e+00; abs: 2.885e-03; rel: 1.673e-03; norm: 1.510e-01; mom: 5.539e+00;
## best it: 209; best obj: 1.672e+00
## It: 457; obj: 1.740e+00; abs: 1.294e-02; rel: 7.494e-03; norm: 1.517e-01; mom: 5.851e+00;
## best it: 209; best obj: 1.672e+00
## It: 458; obj: 1.737e+00; abs: 3.442e-03; rel: 1.978e-03; norm: 1.515e-01; mom: 5.258e+00;
## best it: 209; best obj: 1.672e+00
## It: 459; obj: 1.719e+00; abs: 1.744e-02; rel: 1.004e-02; norm: 1.510e-01; mom: 5.831e+00;
## best it: 209; best obj: 1.672e+00
## It: 460; obj: 1.715e+00; abs: 4.366e-03; rel: 2.539e-03; norm: 1.503e-01; mom: 5.213e+00;
## best it: 209; best obj: 1.672e+00
## It: 461; obj: 1.737e+00; abs: 2.264e-02; rel: 1.320e-02; norm: 1.506e-01; mom: 5.526e+00;
## best it: 209; best obj: 1.672e+00
## It: 462; obj: 1.727e+00; abs: 1.041e-02; rel: 5.993e-03; norm: 1.505e-01; mom: 5.680e+00;
## best it: 209; best obj: 1.672e+00

```

```

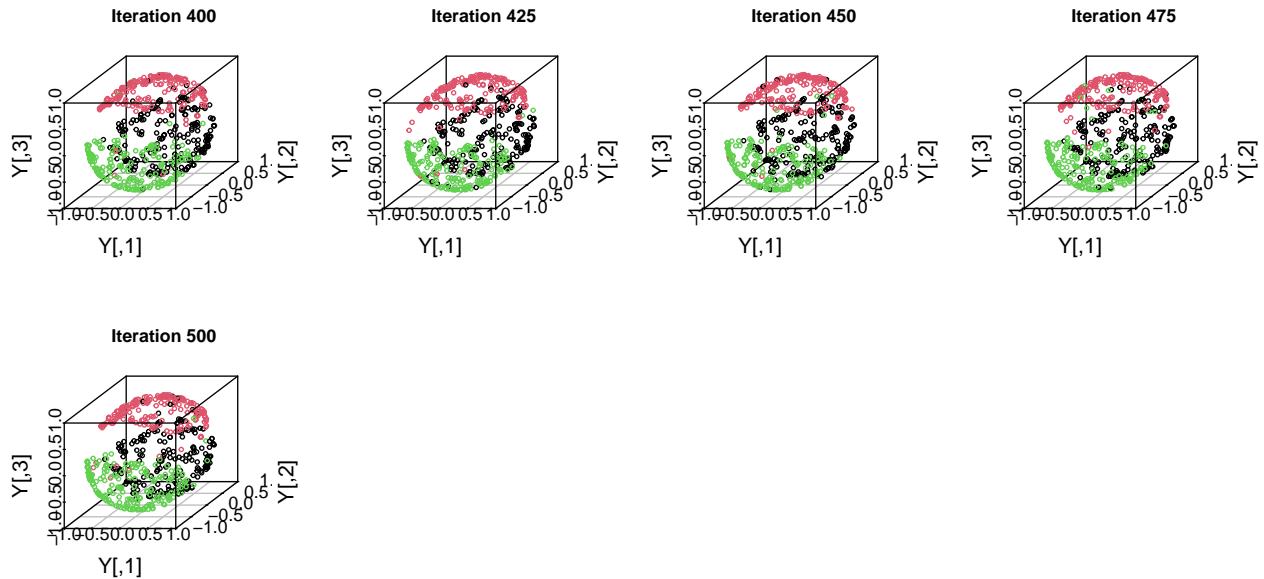
## It: 463; obj: 1.709e+00; abs: 1.808e-02; rel: 1.047e-02; norm: 1.513e-01; mom: 5.881e+00;
## best it: 209; best obj: 1.672e+00
## It: 464; obj: 1.722e+00; abs: 1.299e-02; rel: 7.602e-03; norm: 1.507e-01; mom: 5.612e+00;
## best it: 209; best obj: 1.672e+00
## It: 465; obj: 1.716e+00; abs: 6.035e-03; rel: 3.505e-03; norm: 1.509e-01; mom: 5.639e+00;
## best it: 209; best obj: 1.672e+00
## It: 466; obj: 1.721e+00; abs: 4.914e-03; rel: 2.864e-03; norm: 1.507e-01; mom: 5.604e+00;
## best it: 209; best obj: 1.672e+00
## It: 467; obj: 1.727e+00; abs: 6.208e-03; rel: 3.608e-03; norm: 1.497e-01; mom: 4.608e+00;
## best it: 209; best obj: 1.672e+00
## It: 468; obj: 1.708e+00; abs: 1.893e-02; rel: 1.096e-02; norm: 1.510e-01; mom: 5.686e+00;
## best it: 209; best obj: 1.672e+00
## It: 469; obj: 1.720e+00; abs: 1.164e-02; rel: 6.812e-03; norm: 1.505e-01; mom: 5.269e+00;
## best it: 209; best obj: 1.672e+00
## It: 470; obj: 1.738e+00; abs: 1.809e-02; rel: 1.052e-02; norm: 1.509e-01; mom: 5.128e+00;
## best it: 209; best obj: 1.672e+00
## It: 471; obj: 1.728e+00; abs: 1.004e-02; rel: 5.780e-03; norm: 1.511e-01; mom: 6.117e+00;
## best it: 209; best obj: 1.672e+00
## It: 472; obj: 1.712e+00; abs: 1.554e-02; rel: 8.994e-03; norm: 1.502e-01; mom: 5.425e+00;
## best it: 209; best obj: 1.672e+00
## It: 473; obj: 1.714e+00; abs: 1.839e-03; rel: 1.074e-03; norm: 1.505e-01; mom: 4.857e+00;
## best it: 209; best obj: 1.672e+00
## It: 474; obj: 1.710e+00; abs: 3.820e-03; rel: 2.228e-03; norm: 1.500e-01; mom: 5.596e+00;
## best it: 209; best obj: 1.672e+00
## It: 475; obj: 1.722e+00; abs: 1.182e-02; rel: 6.912e-03; norm: 1.503e-01; mom: 5.287e+00;
## best it: 209; best obj: 1.672e+00
## It: 476; obj: 1.720e+00; abs: 2.014e-03; rel: 1.170e-03; norm: 1.507e-01; mom: 5.440e+00;
## best it: 209; best obj: 1.672e+00
## It: 477; obj: 1.707e+00; abs: 1.260e-02; rel: 7.324e-03; norm: 1.512e-01; mom: 5.868e+00;
## best it: 209; best obj: 1.672e+00
## It: 478; obj: 1.725e+00; abs: 1.771e-02; rel: 1.037e-02; norm: 1.494e-01; mom: 5.102e+00;
## best it: 209; best obj: 1.672e+00
## It: 479; obj: 1.742e+00; abs: 1.675e-02; rel: 9.711e-03; norm: 1.509e-01; mom: 4.921e+00;
## best it: 209; best obj: 1.672e+00
## It: 480; obj: 1.712e+00; abs: 2.990e-02; rel: 1.717e-02; norm: 1.515e-01; mom: 5.549e+00;
## best it: 209; best obj: 1.672e+00
## It: 481; obj: 1.697e+00; abs: 1.551e-02; rel: 9.057e-03; norm: 1.505e-01; mom: 5.264e+00;
## best it: 209; best obj: 1.672e+00
## It: 482; obj: 1.723e+00; abs: 2.666e-02; rel: 1.571e-02; norm: 1.508e-01; mom: 4.686e+00;
## best it: 209; best obj: 1.672e+00
## It: 483; obj: 1.723e+00; abs: 5.824e-05; rel: 3.380e-05; norm: 1.506e-01; mom: 5.766e+00;
## best it: 209; best obj: 1.672e+00
## It: 484; obj: 1.719e+00; abs: 4.089e-03; rel: 2.373e-03; norm: 1.510e-01; mom: 5.181e+00;
## best it: 209; best obj: 1.672e+00
## It: 485; obj: 1.708e+00; abs: 1.070e-02; rel: 6.222e-03; norm: 1.509e-01; mom: 4.852e+00;
## best it: 209; best obj: 1.672e+00
## It: 486; obj: 1.717e+00; abs: 8.638e-03; rel: 5.056e-03; norm: 1.511e-01; mom: 5.708e+00;
## best it: 209; best obj: 1.672e+00
## It: 487; obj: 1.720e+00; abs: 3.063e-03; rel: 1.784e-03; norm: 1.500e-01; mom: 5.231e+00;
## best it: 209; best obj: 1.672e+00
## It: 488; obj: 1.718e+00; abs: 1.831e-03; rel: 1.064e-03; norm: 1.510e-01; mom: 4.920e+00;
## best it: 209; best obj: 1.672e+00
## It: 489; obj: 1.708e+00; abs: 1.076e-02; rel: 6.262e-03; norm: 1.508e-01; mom: 5.513e+00;

```

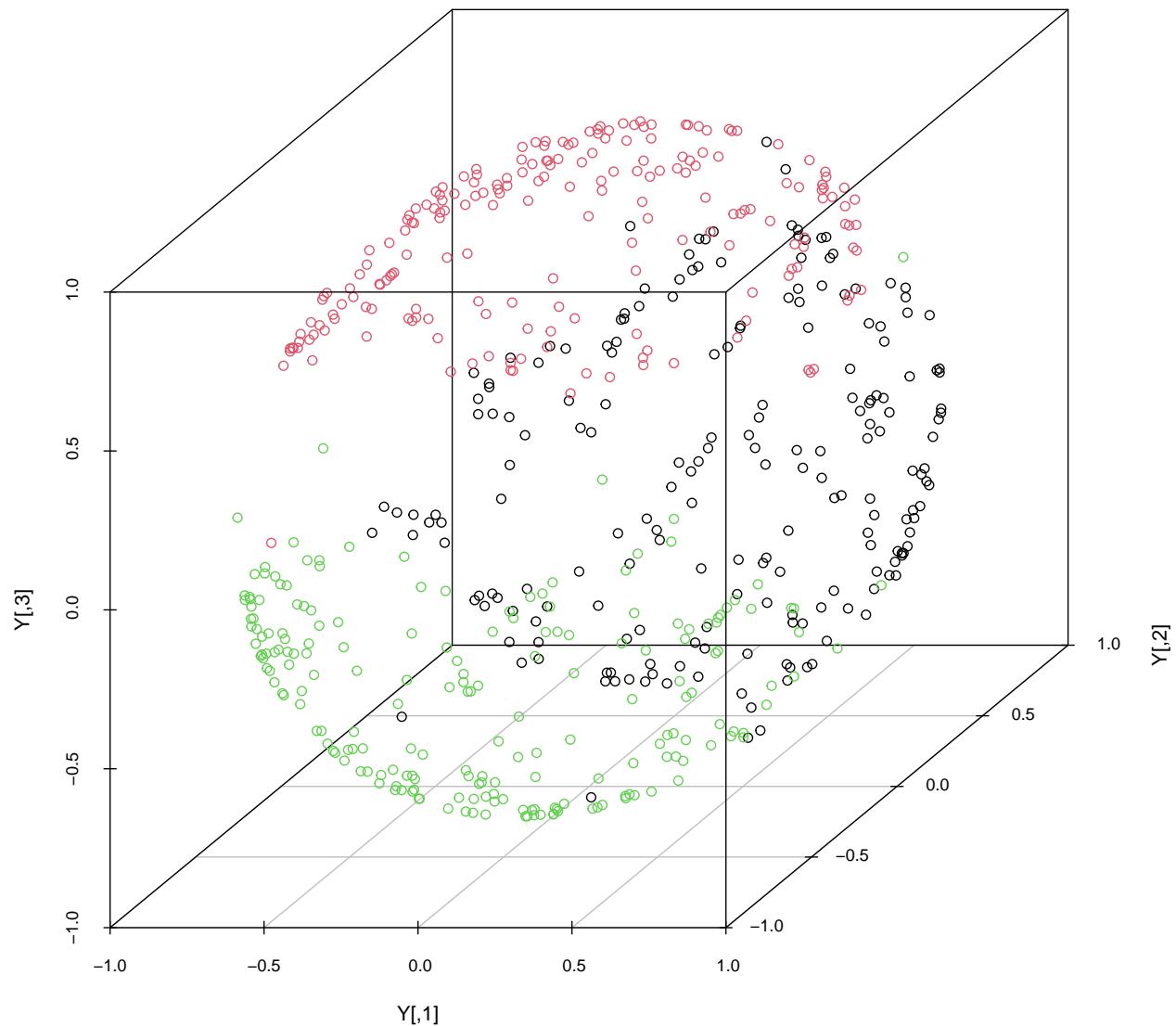
```

## best it: 209; best obj: 1.672e+00
## It: 490; obj: 1.700e+00; abs: 7.208e-03; rel: 4.221e-03; norm: 1.489e-01; mom: 5.384e+00;
## best it: 209; best obj: 1.672e+00
## It: 491; obj: 1.725e+00; abs: 2.420e-02; rel: 1.423e-02; norm: 1.501e-01; mom: 4.458e+00;
## best it: 209; best obj: 1.672e+00
## It: 492; obj: 1.710e+00; abs: 1.479e-02; rel: 8.576e-03; norm: 1.499e-01; mom: 5.386e+00;
## best it: 209; best obj: 1.672e+00
## It: 493; obj: 1.688e+00; abs: 2.129e-02; rel: 1.245e-02; norm: 1.497e-01; mom: 5.092e+00;
## best it: 209; best obj: 1.672e+00
## It: 494; obj: 1.694e+00; abs: 5.203e-03; rel: 3.082e-03; norm: 1.500e-01; mom: 4.769e+00;
## best it: 209; best obj: 1.672e+00
## It: 495; obj: 1.708e+00; abs: 1.419e-02; rel: 8.377e-03; norm: 1.493e-01; mom: 4.790e+00;
## best it: 209; best obj: 1.672e+00
## It: 496; obj: 1.713e+00; abs: 5.554e-03; rel: 3.252e-03; norm: 1.489e-01; mom: 5.082e+00;
## best it: 209; best obj: 1.672e+00
## It: 497; obj: 1.713e+00; abs: 4.463e-04; rel: 2.605e-04; norm: 1.497e-01; mom: 5.306e+00;
## best it: 209; best obj: 1.672e+00
## It: 498; obj: 1.700e+00; abs: 1.308e-02; rel: 7.633e-03; norm: 1.517e-01; mom: 5.602e+00;
## best it: 209; best obj: 1.672e+00
## It: 499; obj: 1.697e+00; abs: 3.358e-03; rel: 1.975e-03; norm: 1.495e-01; mom: 5.095e+00;
## best it: 209; best obj: 1.672e+00
## It: 500; obj: 1.711e+00; abs: 1.407e-02; rel: 8.296e-03; norm: 1.493e-01; mom: 4.843e+00;
## best it: 209; best obj: 1.672e+00

```

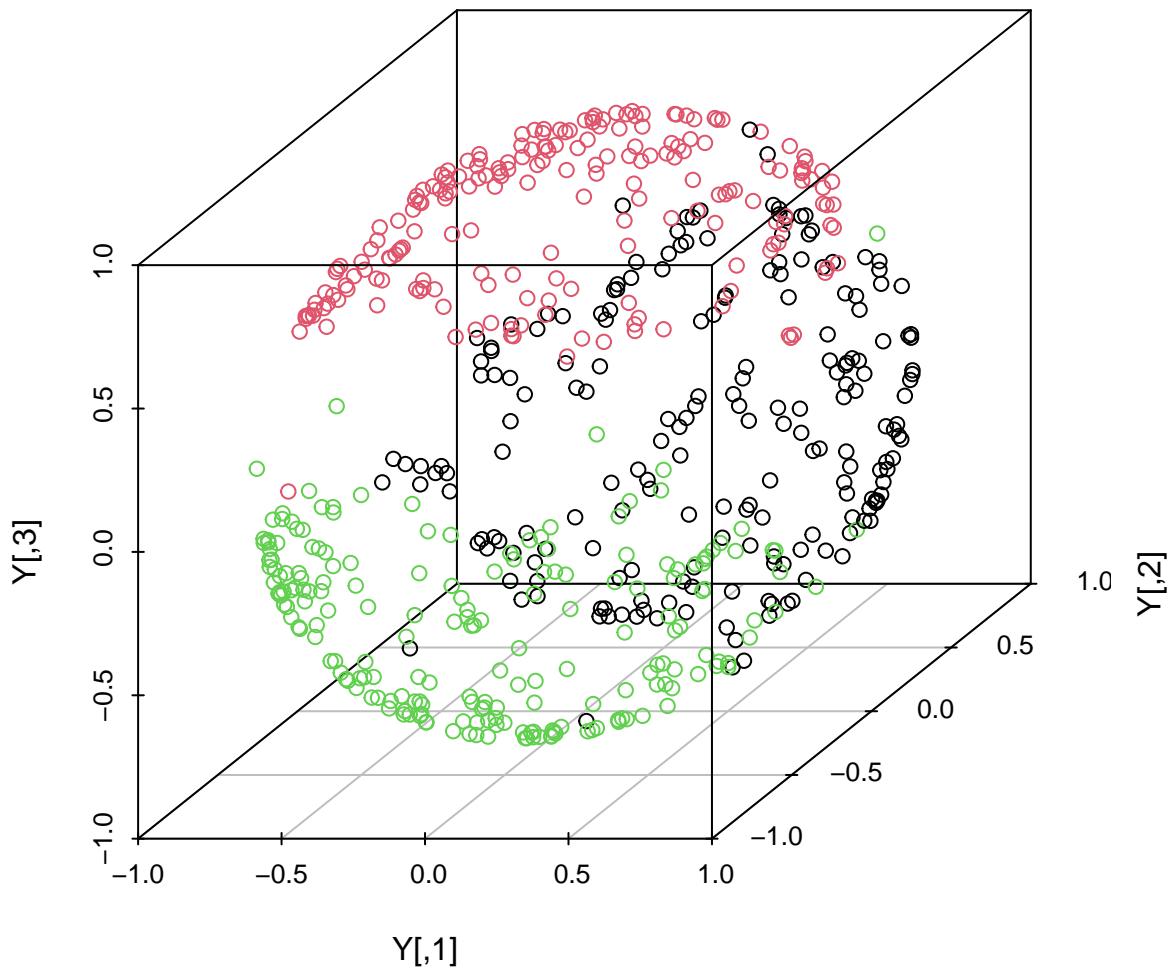


### Iteration 209



```
Y <- res_pcsne$best_Y
```

```
scatterplot3d::scatterplot3d(Y, xlim = c(-1, 1), ylim = c(-1, 1), zlim = c(-1, 1),
color = colors)
```



It's clearly clustered the three groups we had in the original generated data.

### Case 3

Sample on the  $(\mathbb{S}^1)^3$  where  $p = 1$  and  $r = 3$ .

```
# Sample on the (S^1)^2
n_ori <- 200
vmf11 <- rotasym::r_vMF(n = n_ori, mu = drop(DirStats::to_cir(th = 0)), kappa = 10)
vmf12 <- rotasym::r_vMF(n = n_ori, mu = drop(DirStats::to_cir(th = pi)), kappa = 10)
vmf13 <- rotasym::r_vMF(n = n_ori, mu = drop(DirStats::to_cir(th = pi/2)), kappa = 10)
x1 <- sdetorus::toPiInt(cbind(DirStats::to_rad(vmf11),
                                DirStats::to_rad(vmf12),
                                DirStats::to_rad(vmf13)))

vmf21 <- rotasym::r_vMF(n = n_ori, mu = drop(DirStats::to_cir(th = pi / 2)), kappa = 5)
vmf22 <- rotasym::r_vMF(n = n_ori, mu = drop(DirStats::to_cir(th = 0)), kappa = 5)
vmf23 <- rotasym::r_vMF(n = n_ori, mu = drop(DirStats::to_cir(th = pi)), kappa = 5)
x2 <- sdetorus::toPiInt(cbind(DirStats::to_rad(vmf21), DirStats::to_rad(vmf22),
                                DirStats::to_rad(vmf23)))

vmf31 <- rotasym::r_vMF(n = n_ori, mu = drop(DirStats::to_cir(th = pi)), kappa = 30)
vmf32 <- rotasym::r_vMF(n = n_ori, mu = drop(DirStats::to_cir(th = 0)), kappa = 30)
```

```

vmf33 <- rotasym::r_vMF(n = n_ori, mu = drop(DirStats::to_cir(th = pi/2)), kappa = 30)
x3 <- sdetorus::toPiInt(cbind(DirStats::to_rad(vmf31), DirStats::to_rad(vmf32),
                                DirStats::to_rad(vmf33)))

```

Now, let's do the same visualization with the data on the torus:

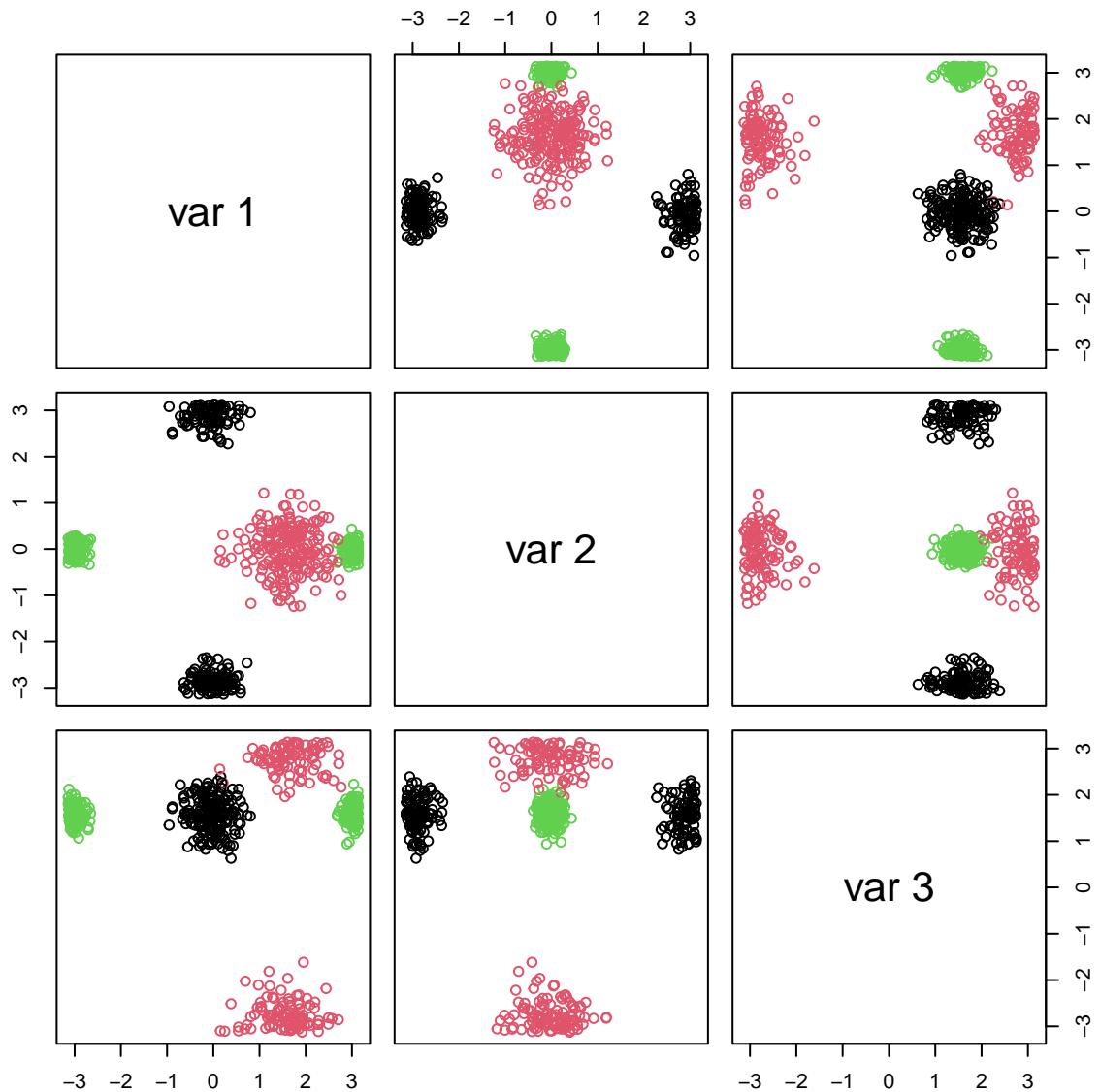
```

x <- rbind(x1, x2, x3)
n <- n_ori * 3
x_3 <- array(dim = c(n, 2, 3))
x_3[, , 1] <- DirStats::to_cir(x[, 1])
x_3[, , 2] <- DirStats::to_cir(x[, 2])
x_3[, , 3] <- DirStats::to_cir(x[, 3])

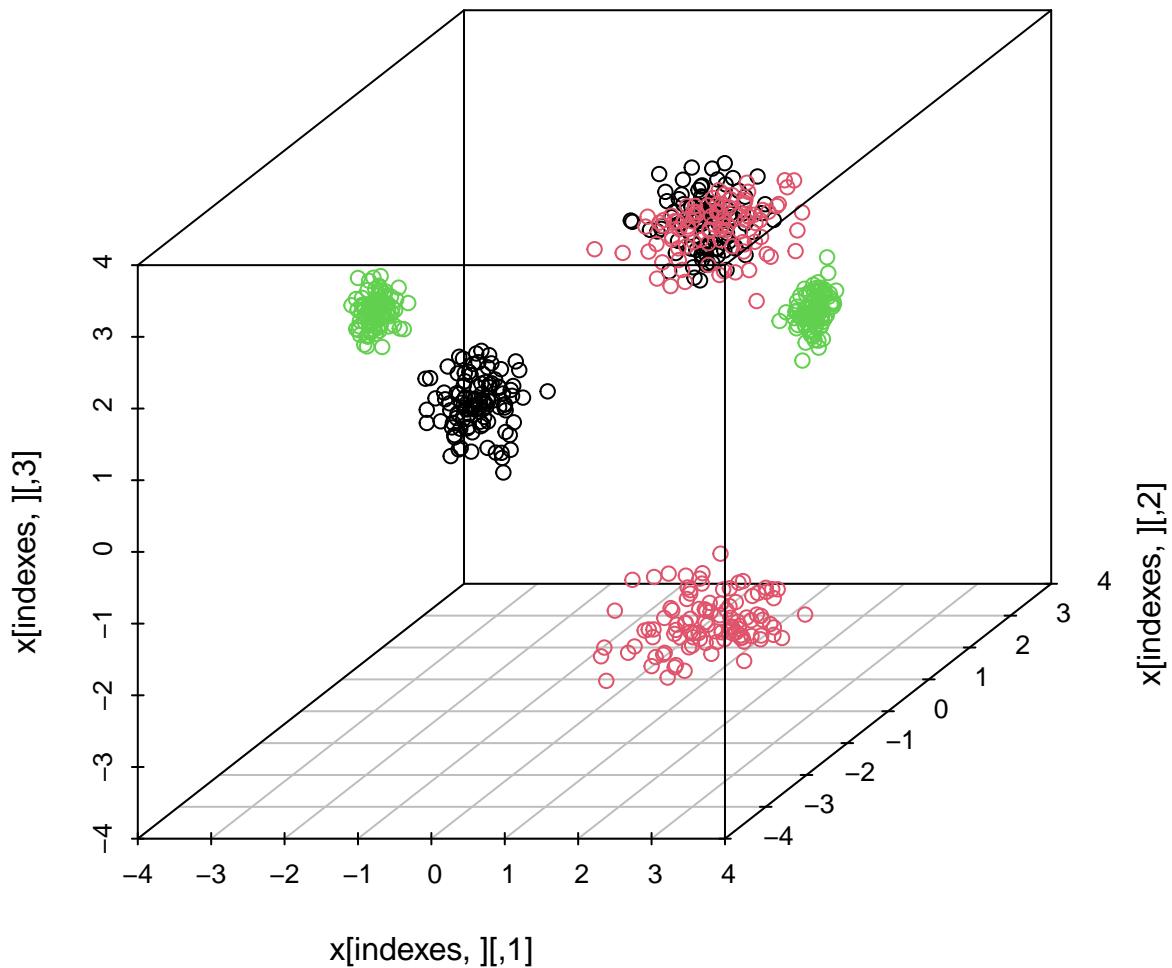
n <- nrow(x_3)
indexes <- sample(1:n)
x_3 <- x_3[indexes,,]
colors <- rep(c(1, 2, 3), each = n / 3)[indexes]

pairs(x[indexes,], col = colors)

```



```
scatterplot3d::scatterplot3d(x[indexes,], xlim = c(-pi, pi), ylim = c(-pi, pi),  
                             zlim = c(-pi, pi),  
                             color = colors)
```



Let's calculate the rho parameters based on a perplexity of 25:

```
rho_third_perp25 <- rho_optim_bst(x_3, 25)
```

## Time difference of 1.111257 mins

First, let's reduce to dimension  $\mathbb{S}^1$  then  $d = 1$  (circumference):

```
res_pscsne <- psc_sne(X=x_3, d=1, rho_psc_list = rho_third_perp25,
                        num_iteration=500, colors=colors, show_prog = TRUE)
```

```
## It: 1; obj: 1.807e+01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.289e-01; mom: 0.000e+00;
## best it: 1; best obj: 1.807e+01
```

```
## It: 2; obj: 1.741e+01; abs: 6.632e-01; rel: 3.670e-02; norm: 2.469e-01; mom: 4.823e+00;
## best it: 2; best obj: 1.741e+01
```

```
## It: 3; obj: 1.696e+01; abs: 4.437e-01; rel: 2.549e-02; norm: 3.346e-01; mom: 3.326e+00;
## best it: 3; best obj: 1.696e+01
```

```
## It: 4; obj: 1.665e+01; abs: 3.160e-01; rel: 1.863e-02; norm: 4.042e-01; mom: 2.681e+00;
## best it: 4; best obj: 1.665e+01
```

```
## It: 5; obj: 1.641e+01; abs: 2.353e-01; rel: 1.413e-02; norm: 4.510e-01; mom: 2.182e+00;
## best it: 5; best obj: 1.641e+01
```

```
## It: 6; obj: 1.618e+01; abs: 2.320e-01; rel: 1.414e-02; norm: 4.823e-01; mom: 1.487e+00;
## best it: 6; best obj: 1.618e+01
```

```
## It: 7; obj: 1.596e+01; abs: 2.238e-01; rel: 1.383e-02; norm: 5.080e-01; mom: 1.369e+00;
```

```

## best it: 7; best obj: 1.596e+01
## It: 8; obj: 1.576e+01; abs: 1.923e-01; rel: 1.205e-02; norm: 5.352e-01; mom: 1.407e+00;
## best it: 8; best obj: 1.576e+01
## It: 9; obj: 1.561e+01; abs: 1.532e-01; rel: 9.716e-03; norm: 5.623e-01; mom: 1.142e+00;
## best it: 9; best obj: 1.561e+01
## It: 10; obj: 1.549e+01; abs: 1.199e-01; rel: 7.679e-03; norm: 5.881e-01; mom: 9.927e-01;
## best it: 10; best obj: 1.549e+01
## It: 11; obj: 1.538e+01; abs: 1.128e-01; rel: 7.282e-03; norm: 6.138e-01; mom: 9.332e-01;
## best it: 11; best obj: 1.538e+01
## It: 12; obj: 1.528e+01; abs: 9.527e-02; rel: 6.195e-03; norm: 6.377e-01; mom: 9.438e-01;
## best it: 12; best obj: 1.528e+01
## It: 13; obj: 1.522e+01; abs: 6.333e-02; rel: 4.144e-03; norm: 6.602e-01; mom: 8.356e-01;
## best it: 13; best obj: 1.522e+01
## It: 14; obj: 1.518e+01; abs: 4.430e-02; rel: 2.910e-03; norm: 6.806e-01; mom: 6.799e-01;
## best it: 14; best obj: 1.518e+01
## It: 15; obj: 1.514e+01; abs: 3.254e-02; rel: 2.144e-03; norm: 6.976e-01; mom: 6.212e-01;
## best it: 15; best obj: 1.514e+01
## It: 16; obj: 1.512e+01; abs: 2.361e-02; rel: 1.559e-03; norm: 7.125e-01; mom: 5.566e-01;
## best it: 16; best obj: 1.512e+01
## It: 17; obj: 1.510e+01; abs: 1.536e-02; rel: 1.016e-03; norm: 7.254e-01; mom: 4.804e-01;
## best it: 17; best obj: 1.510e+01
## It: 18; obj: 1.509e+01; abs: 1.081e-02; rel: 7.160e-04; norm: 7.365e-01; mom: 4.232e-01;
## best it: 18; best obj: 1.509e+01
## It: 19; obj: 1.508e+01; abs: 1.122e-02; rel: 7.437e-04; norm: 7.456e-01; mom: 3.785e-01;
## best it: 19; best obj: 1.508e+01
## It: 20; obj: 1.507e+01; abs: 1.045e-02; rel: 6.930e-04; norm: 7.531e-01; mom: 3.852e-01;
## best it: 20; best obj: 1.507e+01
## It: 21; obj: 1.506e+01; abs: 1.082e-02; rel: 7.178e-04; norm: 7.598e-01; mom: 3.839e-01;
## best it: 21; best obj: 1.506e+01
## It: 22; obj: 1.504e+01; abs: 2.075e-02; rel: 1.378e-03; norm: 7.659e-01; mom: 3.900e-01;
## best it: 22; best obj: 1.504e+01
## It: 23; obj: 1.500e+01; abs: 3.579e-02; rel: 2.380e-03; norm: 7.719e-01; mom: 4.687e-01;
## best it: 23; best obj: 1.500e+01
## It: 24; obj: 1.496e+01; abs: 4.292e-02; rel: 2.860e-03; norm: 7.791e-01; mom: 5.414e-01;
## best it: 24; best obj: 1.496e+01
## It: 25; obj: 1.492e+01; abs: 3.970e-02; rel: 2.653e-03; norm: 7.886e-01; mom: 5.314e-01;
## best it: 25; best obj: 1.492e+01

## It: 26; obj: 1.489e+01; abs: 3.127e-02; rel: 2.095e-03; norm: 7.998e-01; mom: 4.893e-01;
## best it: 26; best obj: 1.489e+01
## It: 27; obj: 1.487e+01; abs: 2.177e-02; rel: 1.462e-03; norm: 8.108e-01; mom: 5.033e-01;
## best it: 27; best obj: 1.487e+01
## It: 28; obj: 1.485e+01; abs: 1.355e-02; rel: 9.114e-04; norm: 8.210e-01; mom: 4.572e-01;
## best it: 28; best obj: 1.485e+01
## It: 29; obj: 1.485e+01; abs: 5.616e-03; rel: 3.780e-04; norm: 8.307e-01; mom: 3.843e-01;
## best it: 29; best obj: 1.485e+01
## It: 30; obj: 1.485e+01; abs: 1.278e-03; rel: 8.604e-05; norm: 8.399e-01; mom: 3.402e-01;
## best it: 29; best obj: 1.485e+01
## It: 31; obj: 1.486e+01; abs: 5.311e-03; rel: 3.576e-04; norm: 8.485e-01; mom: 3.114e-01;
## best it: 29; best obj: 1.485e+01
## It: 32; obj: 1.486e+01; abs: 6.238e-03; rel: 4.199e-04; norm: 8.566e-01; mom: 2.984e-01;
## best it: 29; best obj: 1.485e+01
## It: 33; obj: 1.487e+01; abs: 6.158e-03; rel: 4.144e-04; norm: 8.641e-01; mom: 3.097e-01;
## best it: 29; best obj: 1.485e+01

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## It: 34; obj: 1.487e+01; abs: 6.112e-03; rel: 4.111e-04; norm: 8.715e-01; mom: 3.246e-01;
## best it: 29; best obj: 1.485e+01
## It: 35; obj: 1.488e+01; abs: 6.771e-03; rel: 4.552e-04; norm: 8.789e-01; mom: 3.304e-01;
## best it: 29; best obj: 1.485e+01
## It: 36; obj: 1.489e+01; abs: 9.591e-03; rel: 6.445e-04; norm: 8.866e-01; mom: 3.282e-01;
## best it: 29; best obj: 1.485e+01
## It: 37; obj: 1.490e+01; abs: 1.175e-02; rel: 7.892e-04; norm: 8.944e-01; mom: 3.151e-01;
## best it: 29; best obj: 1.485e+01
## It: 38; obj: 1.491e+01; abs: 5.247e-03; rel: 3.521e-04; norm: 9.016e-01; mom: 3.695e-01;
## best it: 29; best obj: 1.485e+01
## It: 39; obj: 1.493e+01; abs: 1.799e-02; rel: 1.207e-03; norm: 9.083e-01; mom: 6.084e-01;
## best it: 29; best obj: 1.485e+01
## It: 40; obj: 1.494e+01; abs: 1.767e-02; rel: 1.184e-03; norm: 9.137e-01; mom: 2.536e-01;
## best it: 29; best obj: 1.485e+01
## It: 41; obj: 1.495e+01; abs: 9.164e-03; rel: 6.132e-04; norm: 9.187e-01; mom: 2.731e-01;
## best it: 29; best obj: 1.485e+01
## It: 42; obj: 1.496e+01; abs: 8.689e-03; rel: 5.811e-04; norm: 9.241e-01; mom: 3.494e-01;
## best it: 29; best obj: 1.485e+01
## It: 43; obj: 1.498e+01; abs: 1.694e-02; rel: 1.132e-03; norm: 9.296e-01; mom: 3.395e-01;
## best it: 29; best obj: 1.485e+01
## It: 44; obj: 1.500e+01; abs: 1.866e-02; rel: 1.246e-03; norm: 9.340e-01; mom: 2.283e-01;
## best it: 29; best obj: 1.485e+01
## It: 45; obj: 1.501e+01; abs: 1.760e-02; rel: 1.174e-03; norm: 9.380e-01; mom: 2.201e-01;
## best it: 29; best obj: 1.485e+01
## It: 46; obj: 1.503e+01; abs: 1.499e-02; rel: 9.983e-04; norm: 9.421e-01; mom: 2.456e-01;
## best it: 29; best obj: 1.485e+01
## It: 47; obj: 1.504e+01; abs: 1.421e-02; rel: 9.456e-04; norm: 9.467e-01; mom: 2.746e-01;
## best it: 29; best obj: 1.485e+01
## It: 48; obj: 1.506e+01; abs: 1.524e-02; rel: 1.013e-03; norm: 9.516e-01; mom: 2.831e-01;
## best it: 29; best obj: 1.485e+01
## It: 49; obj: 1.507e+01; abs: 1.459e-02; rel: 9.687e-04; norm: 9.562e-01; mom: 2.748e-01;
## best it: 29; best obj: 1.485e+01
## It: 50; obj: 1.509e+01; abs: 1.629e-02; rel: 1.081e-03; norm: 9.606e-01; mom: 2.860e-01;
## best it: 29; best obj: 1.485e+01

## It: 51; obj: 1.511e+01; abs: 1.653e-02; rel: 1.096e-03; norm: 9.645e-01; mom: 2.629e-01;
## best it: 29; best obj: 1.485e+01
## It: 52; obj: 1.512e+01; abs: 1.429e-02; rel: 9.462e-04; norm: 9.683e-01; mom: 2.561e-01;
## best it: 29; best obj: 1.485e+01
## It: 53; obj: 1.513e+01; abs: 1.027e-02; rel: 6.794e-04; norm: 9.721e-01; mom: 2.702e-01;
## best it: 29; best obj: 1.485e+01
## It: 54; obj: 1.513e+01; abs: 3.554e-03; rel: 2.349e-04; norm: 9.763e-01; mom: 2.867e-01;
## best it: 29; best obj: 1.485e+01
## It: 55; obj: 1.513e+01; abs: 5.179e-03; rel: 3.422e-04; norm: 9.808e-01; mom: 3.104e-01;
## best it: 29; best obj: 1.485e+01
## It: 56; obj: 1.512e+01; abs: 1.312e-02; rel: 8.669e-04; norm: 9.857e-01; mom: 3.360e-01;
## best it: 29; best obj: 1.485e+01
## It: 57; obj: 1.510e+01; abs: 1.799e-02; rel: 1.190e-03; norm: 9.902e-01; mom: 3.493e-01;
## best it: 29; best obj: 1.485e+01
## It: 58; obj: 1.508e+01; abs: 2.112e-02; rel: 1.399e-03; norm: 9.937e-01; mom: 3.403e-01;
## best it: 29; best obj: 1.485e+01
## It: 59; obj: 1.505e+01; abs: 2.304e-02; rel: 1.528e-03; norm: 9.960e-01; mom: 3.238e-01;
## best it: 29; best obj: 1.485e+01
## It: 60; obj: 1.503e+01; abs: 2.390e-02; rel: 1.588e-03; norm: 9.974e-01; mom: 3.075e-01;

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## best it: 29; best obj: 1.485e+01
## It: 61; obj: 1.500e+01; abs: 2.542e-02; rel: 1.691e-03; norm: 9.980e-01; mom: 2.959e-01;
## best it: 29; best obj: 1.485e+01
## It: 62; obj: 1.497e+01; abs: 2.970e-02; rel: 1.979e-03; norm: 9.980e-01; mom: 2.982e-01;
## best it: 29; best obj: 1.485e+01
## It: 63; obj: 1.494e+01; abs: 3.696e-02; rel: 2.468e-03; norm: 9.975e-01; mom: 3.178e-01;
## best it: 29; best obj: 1.485e+01
## It: 64; obj: 1.489e+01; abs: 4.405e-02; rel: 2.949e-03; norm: 9.971e-01; mom: 3.433e-01;
## best it: 29; best obj: 1.485e+01
## It: 65; obj: 1.485e+01; abs: 4.402e-02; rel: 2.955e-03; norm: 9.967e-01; mom: 3.598e-01;
## best it: 29; best obj: 1.485e+01
## It: 66; obj: 1.481e+01; abs: 3.652e-02; rel: 2.459e-03; norm: 9.954e-01; mom: 3.444e-01;
## best it: 66; best obj: 1.481e+01
## It: 67; obj: 1.478e+01; abs: 2.859e-02; rel: 1.930e-03; norm: 9.923e-01; mom: 2.981e-01;
## best it: 67; best obj: 1.478e+01
## It: 68; obj: 1.476e+01; abs: 2.306e-02; rel: 1.560e-03; norm: 9.880e-01; mom: 2.476e-01;
## best it: 68; best obj: 1.476e+01
## It: 69; obj: 1.474e+01; abs: 1.936e-02; rel: 1.312e-03; norm: 9.829e-01; mom: 2.077e-01;
## best it: 69; best obj: 1.474e+01
## It: 70; obj: 1.473e+01; abs: 1.674e-02; rel: 1.135e-03; norm: 9.777e-01; mom: 1.784e-01;
## best it: 70; best obj: 1.473e+01
## It: 71; obj: 1.471e+01; abs: 1.475e-02; rel: 1.002e-03; norm: 9.724e-01; mom: 1.569e-01;
## best it: 71; best obj: 1.471e+01
## It: 72; obj: 1.470e+01; abs: 1.317e-02; rel: 8.952e-04; norm: 9.672e-01; mom: 1.403e-01;
## best it: 72; best obj: 1.470e+01
## It: 73; obj: 1.469e+01; abs: 1.186e-02; rel: 8.072e-04; norm: 9.622e-01; mom: 1.272e-01;
## best it: 73; best obj: 1.469e+01
## It: 74; obj: 1.468e+01; abs: 1.076e-02; rel: 7.329e-04; norm: 9.573e-01; mom: 1.165e-01;
## best it: 74; best obj: 1.468e+01
## It: 75; obj: 1.467e+01; abs: 9.818e-03; rel: 6.690e-04; norm: 9.526e-01; mom: 1.074e-01;
## best it: 75; best obj: 1.467e+01

## It: 76; obj: 1.466e+01; abs: 8.998e-03; rel: 6.135e-04; norm: 9.481e-01; mom: 9.972e-02;
## best it: 76; best obj: 1.466e+01
## It: 77; obj: 1.465e+01; abs: 8.278e-03; rel: 5.648e-04; norm: 9.437e-01; mom: 9.299e-02;
## best it: 77; best obj: 1.465e+01
## It: 78; obj: 1.464e+01; abs: 7.642e-03; rel: 5.217e-04; norm: 9.395e-01; mom: 8.707e-02;
## best it: 78; best obj: 1.464e+01
## It: 79; obj: 1.463e+01; abs: 7.077e-03; rel: 4.834e-04; norm: 9.355e-01; mom: 8.180e-02;
## best it: 79; best obj: 1.463e+01
## It: 80; obj: 1.463e+01; abs: 6.572e-03; rel: 4.491e-04; norm: 9.316e-01; mom: 7.707e-02;
## best it: 80; best obj: 1.463e+01
## It: 81; obj: 1.462e+01; abs: 6.117e-03; rel: 4.182e-04; norm: 9.278e-01; mom: 7.279e-02;
## best it: 81; best obj: 1.462e+01
## It: 82; obj: 1.461e+01; abs: 5.707e-03; rel: 3.904e-04; norm: 9.242e-01; mom: 6.890e-02;
## best it: 82; best obj: 1.461e+01
## It: 83; obj: 1.461e+01; abs: 5.336e-03; rel: 3.651e-04; norm: 9.207e-01; mom: 6.535e-02;
## best it: 83; best obj: 1.461e+01
## It: 84; obj: 1.460e+01; abs: 4.999e-03; rel: 3.421e-04; norm: 9.174e-01; mom: 6.208e-02;
## best it: 84; best obj: 1.460e+01
## It: 85; obj: 1.460e+01; abs: 4.691e-03; rel: 3.212e-04; norm: 9.141e-01; mom: 5.908e-02;
## best it: 85; best obj: 1.460e+01
## It: 86; obj: 1.460e+01; abs: 4.409e-03; rel: 3.020e-04; norm: 9.110e-01; mom: 5.630e-02;
## best it: 86; best obj: 1.460e+01

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## It: 87; obj: 1.459e+01; abs: 4.151e-03; rel: 2.844e-04; norm: 9.079e-01; mom: 5.372e-02;
## best it: 87; best obj: 1.459e+01
## It: 88; obj: 1.459e+01; abs: 3.913e-03; rel: 2.682e-04; norm: 9.050e-01; mom: 5.132e-02;
## best it: 88; best obj: 1.459e+01
## It: 89; obj: 1.458e+01; abs: 3.694e-03; rel: 2.532e-04; norm: 9.022e-01; mom: 4.908e-02;
## best it: 89; best obj: 1.458e+01
## It: 90; obj: 1.458e+01; abs: 3.492e-03; rel: 2.394e-04; norm: 8.995e-01; mom: 4.699e-02;
## best it: 90; best obj: 1.458e+01
## It: 91; obj: 1.458e+01; abs: 3.304e-03; rel: 2.266e-04; norm: 8.968e-01; mom: 4.503e-02;
## best it: 91; best obj: 1.458e+01
## It: 92; obj: 1.457e+01; abs: 3.130e-03; rel: 2.147e-04; norm: 8.943e-01; mom: 4.319e-02;
## best it: 92; best obj: 1.457e+01
## It: 93; obj: 1.457e+01; abs: 2.968e-03; rel: 2.036e-04; norm: 8.918e-01; mom: 4.146e-02;
## best it: 93; best obj: 1.457e+01
## It: 94; obj: 1.457e+01; abs: 2.817e-03; rel: 1.933e-04; norm: 8.894e-01; mom: 3.983e-02;
## best it: 94; best obj: 1.457e+01
## It: 95; obj: 1.457e+01; abs: 2.676e-03; rel: 1.837e-04; norm: 8.870e-01; mom: 3.829e-02;
## best it: 95; best obj: 1.457e+01
## It: 96; obj: 1.456e+01; abs: 2.544e-03; rel: 1.747e-04; norm: 8.848e-01; mom: 3.684e-02;
## best it: 96; best obj: 1.456e+01
## It: 97; obj: 1.456e+01; abs: 2.421e-03; rel: 1.662e-04; norm: 8.826e-01; mom: 3.562e-02;
## best it: 97; best obj: 1.456e+01
## It: 98; obj: 1.456e+01; abs: 2.305e-03; rel: 1.583e-04; norm: 8.805e-01; mom: 3.468e-02;
## best it: 98; best obj: 1.456e+01
## It: 99; obj: 1.456e+01; abs: 2.196e-03; rel: 1.509e-04; norm: 8.784e-01; mom: 3.377e-02;
## best it: 99; best obj: 1.456e+01
## It: 100; obj: 1.455e+01; abs: 2.094e-03; rel: 1.439e-04; norm: 8.764e-01; mom: 3.289e-02;
## best it: 100; best obj: 1.455e+01

## It: 101; obj: 2.232e+00; abs: 1.232e+01; rel: 8.467e-01; norm: 8.103e-02; mom: 3.203e-02;
## best it: 101; best obj: 2.232e+00
## It: 102; obj: 2.193e+00; abs: 3.892e-02; rel: 1.744e-02; norm: 8.399e-02; mom: 9.122e-01;
## best it: 102; best obj: 2.193e+00
## It: 103; obj: 2.158e+00; abs: 3.458e-02; rel: 1.577e-02; norm: 9.171e-02; mom: 1.323e+00;
## best it: 103; best obj: 2.158e+00
## It: 104; obj: 2.141e+00; abs: 1.747e-02; rel: 8.093e-03; norm: 9.935e-02; mom: 9.089e-01;
## best it: 104; best obj: 2.141e+00
## It: 105; obj: 2.134e+00; abs: 6.953e-03; rel: 3.248e-03; norm: 1.031e-01; mom: 7.016e-01;
## best it: 105; best obj: 2.134e+00
## It: 106; obj: 2.131e+00; abs: 2.950e-03; rel: 1.382e-03; norm: 1.044e-01; mom: 4.706e-01;
## best it: 106; best obj: 2.131e+00
## It: 107; obj: 2.130e+00; abs: 1.359e-03; rel: 6.376e-04; norm: 1.048e-01; mom: 3.360e-01;
## best it: 107; best obj: 2.130e+00
## It: 108; obj: 2.129e+00; abs: 8.966e-04; rel: 4.210e-04; norm: 1.048e-01; mom: 2.174e-01;
## best it: 108; best obj: 2.129e+00
## It: 109; obj: 2.128e+00; abs: 5.727e-04; rel: 2.691e-04; norm: 1.048e-01; mom: 1.505e-01;
## best it: 109; best obj: 2.128e+00
## It: 110; obj: 2.128e+00; abs: 3.665e-04; rel: 1.722e-04; norm: 1.048e-01; mom: 1.320e-01;
## best it: 110; best obj: 2.128e+00
## It: 111; obj: 2.127e+00; abs: 2.941e-04; rel: 1.382e-04; norm: 1.048e-01; mom: 9.956e-02;
## best it: 111; best obj: 2.127e+00
## It: 112; obj: 2.127e+00; abs: 2.227e-04; rel: 1.047e-04; norm: 1.047e-01; mom: 8.345e-02;
## best it: 112; best obj: 2.127e+00
## It: 113; obj: 2.127e+00; abs: 1.770e-04; rel: 8.321e-05; norm: 1.047e-01; mom: 7.553e-02;

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## best it: 113; best obj: 2.127e+00
## It: 114; obj: 2.127e+00; abs: 1.475e-04; rel: 6.933e-05; norm: 1.047e-01; mom: 6.141e-02;
## best it: 114; best obj: 2.127e+00
## It: 115; obj: 2.127e+00; abs: 1.205e-04; rel: 5.668e-05; norm: 1.047e-01; mom: 5.738e-02;
## best it: 115; best obj: 2.127e+00
## It: 116; obj: 2.127e+00; abs: 1.035e-04; rel: 4.867e-05; norm: 1.047e-01; mom: 5.077e-02;
## best it: 116; best obj: 2.127e+00
## It: 117; obj: 2.127e+00; abs: 8.776e-05; rel: 4.127e-05; norm: 1.047e-01; mom: 4.620e-02;
## best it: 117; best obj: 2.127e+00
## It: 118; obj: 2.126e+00; abs: 7.535e-05; rel: 3.543e-05; norm: 1.047e-01; mom: 4.319e-02;
## best it: 118; best obj: 2.126e+00
## It: 119; obj: 2.126e+00; abs: 6.554e-05; rel: 3.082e-05; norm: 1.047e-01; mom: 3.864e-02;
## best it: 119; best obj: 2.126e+00
## It: 120; obj: 2.126e+00; abs: 5.650e-05; rel: 2.657e-05; norm: 1.047e-01; mom: 3.599e-02;
## best it: 120; best obj: 2.126e+00
## It: 121; obj: 2.126e+00; abs: 4.961e-05; rel: 2.333e-05; norm: 1.047e-01; mom: 3.335e-02;
## best it: 121; best obj: 2.126e+00
## It: 122; obj: 2.126e+00; abs: 4.375e-05; rel: 2.057e-05; norm: 1.047e-01; mom: 3.107e-02;
## best it: 122; best obj: 2.126e+00
## It: 123; obj: 2.126e+00; abs: 3.881e-05; rel: 1.825e-05; norm: 1.047e-01; mom: 2.942e-02;
## best it: 123; best obj: 2.126e+00
## It: 124; obj: 2.126e+00; abs: 3.480e-05; rel: 1.637e-05; norm: 1.047e-01; mom: 2.771e-02;
## best it: 124; best obj: 2.126e+00
## It: 125; obj: 2.126e+00; abs: 3.133e-05; rel: 1.474e-05; norm: 1.047e-01; mom: 2.631e-02;
## best it: 125; best obj: 2.126e+00

## It: 126; obj: 2.126e+00; abs: 2.850e-05; rel: 1.340e-05; norm: 1.047e-01; mom: 2.516e-02;
## best it: 126; best obj: 2.126e+00
## It: 127; obj: 2.126e+00; abs: 2.617e-05; rel: 1.231e-05; norm: 1.047e-01; mom: 2.426e-02;
## best it: 127; best obj: 2.126e+00
## It: 128; obj: 2.126e+00; abs: 2.429e-05; rel: 1.143e-05; norm: 1.048e-01; mom: 2.361e-02;
## best it: 128; best obj: 2.126e+00
## It: 129; obj: 2.126e+00; abs: 2.285e-05; rel: 1.075e-05; norm: 1.048e-01; mom: 2.315e-02;
## best it: 129; best obj: 2.126e+00
## It: 130; obj: 2.126e+00; abs: 2.180e-05; rel: 1.025e-05; norm: 1.048e-01; mom: 2.288e-02;
## best it: 130; best obj: 2.126e+00
## It: 131; obj: 2.126e+00; abs: 2.113e-05; rel: 9.938e-06; norm: 1.048e-01; mom: 2.281e-02;
## best it: 131; best obj: 2.126e+00
## It: 132; obj: 2.126e+00; abs: 2.086e-05; rel: 9.810e-06; norm: 1.048e-01; mom: 2.296e-02;
## best it: 132; best obj: 2.126e+00
## It: 133; obj: 2.126e+00; abs: 2.100e-05; rel: 9.878e-06; norm: 1.048e-01; mom: 2.336e-02;
## best it: 133; best obj: 2.126e+00
## It: 134; obj: 2.126e+00; abs: 2.160e-05; rel: 1.016e-05; norm: 1.048e-01; mom: 2.402e-02;
## best it: 134; best obj: 2.126e+00
## It: 135; obj: 2.126e+00; abs: 2.269e-05; rel: 1.067e-05; norm: 1.048e-01; mom: 2.495e-02;
## best it: 135; best obj: 2.126e+00
## It: 136; obj: 2.126e+00; abs: 2.431e-05; rel: 1.143e-05; norm: 1.048e-01; mom: 2.618e-02;
## best it: 136; best obj: 2.126e+00
## It: 137; obj: 2.126e+00; abs: 2.648e-05; rel: 1.246e-05; norm: 1.049e-01; mom: 2.770e-02;
## best it: 137; best obj: 2.126e+00
## It: 138; obj: 2.126e+00; abs: 2.917e-05; rel: 1.372e-05; norm: 1.049e-01; mom: 2.949e-02;
## best it: 138; best obj: 2.126e+00
## It: 139; obj: 2.126e+00; abs: 3.223e-05; rel: 1.516e-05; norm: 1.049e-01; mom: 3.149e-02;
## best it: 139; best obj: 2.126e+00

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## It: 140; obj: 2.126e+00; abs: 3.537e-05; rel: 1.664e-05; norm: 1.049e-01; mom: 3.361e-02;
## best it: 140; best obj: 2.126e+00
## It: 141; obj: 2.126e+00; abs: 3.814e-05; rel: 1.794e-05; norm: 1.050e-01; mom: 3.566e-02;
## best it: 141; best obj: 2.126e+00
## It: 142; obj: 2.126e+00; abs: 3.997e-05; rel: 1.880e-05; norm: 1.050e-01; mom: 3.742e-02;
## best it: 142; best obj: 2.126e+00
## It: 143; obj: 2.126e+00; abs: 4.036e-05; rel: 1.899e-05; norm: 1.050e-01; mom: 3.863e-02;
## best it: 143; best obj: 2.126e+00
## It: 144; obj: 2.126e+00; abs: 3.909e-05; rel: 1.839e-05; norm: 1.051e-01; mom: 3.907e-02;
## best it: 144; best obj: 2.126e+00
## It: 145; obj: 2.126e+00; abs: 3.630e-05; rel: 1.708e-05; norm: 1.051e-01; mom: 3.860e-02;
## best it: 145; best obj: 2.126e+00
## It: 146; obj: 2.126e+00; abs: 3.245e-05; rel: 1.527e-05; norm: 1.051e-01; mom: 3.724e-02;
## best it: 146; best obj: 2.126e+00
## It: 147; obj: 2.126e+00; abs: 2.813e-05; rel: 1.323e-05; norm: 1.052e-01; mom: 3.515e-02;
## best it: 147; best obj: 2.126e+00
## It: 148; obj: 2.126e+00; abs: 2.381e-05; rel: 1.120e-05; norm: 1.052e-01; mom: 3.258e-02;
## best it: 148; best obj: 2.126e+00
## It: 149; obj: 2.125e+00; abs: 1.981e-05; rel: 9.319e-06; norm: 1.052e-01; mom: 2.978e-02;
## best it: 149; best obj: 2.125e+00
## It: 150; obj: 2.125e+00; abs: 1.629e-05; rel: 7.662e-06; norm: 1.053e-01; mom: 2.695e-02;
## best it: 150; best obj: 2.125e+00

## It: 151; obj: 2.125e+00; abs: 1.328e-05; rel: 6.250e-06; norm: 1.053e-01; mom: 2.423e-02;
## best it: 151; best obj: 2.125e+00
## It: 152; obj: 2.125e+00; abs: 1.078e-05; rel: 5.071e-06; norm: 1.053e-01; mom: 2.170e-02;
## best it: 152; best obj: 2.125e+00
## It: 153; obj: 2.125e+00; abs: 8.716e-06; rel: 4.101e-06; norm: 1.053e-01; mom: 1.940e-02;
## best it: 153; best obj: 2.125e+00
## It: 154; obj: 2.125e+00; abs: 7.038e-06; rel: 3.311e-06; norm: 1.053e-01; mom: 1.731e-02;
## best it: 154; best obj: 2.125e+00
## It: 155; obj: 2.125e+00; abs: 5.682e-06; rel: 2.674e-06; norm: 1.054e-01; mom: 1.545e-02;
## best it: 155; best obj: 2.125e+00
## It: 156; obj: 2.125e+00; abs: 4.593e-06; rel: 2.161e-06; norm: 1.054e-01; mom: 1.378e-02;
## best it: 156; best obj: 2.125e+00
## It: 157; obj: 2.125e+00; abs: 3.722e-06; rel: 1.751e-06; norm: 1.054e-01; mom: 1.231e-02;
## best it: 157; best obj: 2.125e+00
## It: 158; obj: 2.125e+00; abs: 3.026e-06; rel: 1.424e-06; norm: 1.054e-01; mom: 1.100e-02;
## best it: 158; best obj: 2.125e+00
## It: 159; obj: 2.125e+00; abs: 2.470e-06; rel: 1.162e-06; norm: 1.054e-01; mom: 9.854e-03;
## best it: 159; best obj: 2.125e+00
## It: 160; obj: 2.125e+00; abs: 2.027e-06; rel: 9.536e-07; norm: 1.054e-01; mom: 8.843e-03;
## best it: 160; best obj: 2.125e+00
## It: 161; obj: 2.125e+00; abs: 1.672e-06; rel: 7.867e-07; norm: 1.054e-01; mom: 7.956e-03;
## best it: 161; best obj: 2.125e+00
## It: 162; obj: 2.125e+00; abs: 1.388e-06; rel: 6.528e-07; norm: 1.054e-01; mom: 7.178e-03;
## best it: 162; best obj: 2.125e+00
## It: 163; obj: 2.125e+00; abs: 1.159e-06; rel: 5.451e-07; norm: 1.054e-01; mom: 6.496e-03;
## best it: 163; best obj: 2.125e+00
## It: 164; obj: 2.125e+00; abs: 9.732e-07; rel: 4.579e-07; norm: 1.054e-01; mom: 5.898e-03;
## best it: 164; best obj: 2.125e+00
## It: 165; obj: 2.125e+00; abs: 8.224e-07; rel: 3.870e-07; norm: 1.054e-01; mom: 5.374e-03;
## best it: 165; best obj: 2.125e+00
## It: 166; obj: 2.125e+00; abs: 6.991e-07; rel: 3.289e-07; norm: 1.054e-01; mom: 4.913e-03;

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## best it: 166; best obj: 2.125e+00
## It: 167; obj: 2.125e+00; abs: 5.975e-07; rel: 2.811e-07; norm: 1.054e-01; mom: 4.506e-03;
## best it: 167; best obj: 2.125e+00
## It: 168; obj: 2.125e+00; abs: 5.134e-07; rel: 2.415e-07; norm: 1.054e-01; mom: 4.146e-03;
## best it: 168; best obj: 2.125e+00
## It: 169; obj: 2.125e+00; abs: 4.431e-07; rel: 2.085e-07; norm: 1.054e-01; mom: 3.826e-03;
## best it: 169; best obj: 2.125e+00
## It: 170; obj: 2.125e+00; abs: 3.842e-07; rel: 1.808e-07; norm: 1.054e-01; mom: 3.540e-03;
## best it: 170; best obj: 2.125e+00
## It: 171; obj: 2.125e+00; abs: 3.344e-07; rel: 1.573e-07; norm: 1.054e-01; mom: 3.284e-03;
## best it: 171; best obj: 2.125e+00
## It: 172; obj: 2.125e+00; abs: 2.921e-07; rel: 1.374e-07; norm: 1.054e-01; mom: 3.053e-03;
## best it: 172; best obj: 2.125e+00
## It: 173; obj: 2.125e+00; abs: 2.560e-07; rel: 1.204e-07; norm: 1.054e-01; mom: 2.843e-03;
## best it: 173; best obj: 2.125e+00
## It: 174; obj: 2.125e+00; abs: 2.249e-07; rel: 1.058e-07; norm: 1.054e-01; mom: 2.653e-03;
## best it: 174; best obj: 2.125e+00
## It: 175; obj: 2.125e+00; abs: 1.982e-07; rel: 9.324e-08; norm: 1.054e-01; mom: 2.479e-03;
## best it: 175; best obj: 2.125e+00

## It: 176; obj: 2.125e+00; abs: 1.750e-07; rel: 8.232e-08; norm: 1.054e-01; mom: 2.319e-03;
## best it: 176; best obj: 2.125e+00
## It: 177; obj: 2.125e+00; abs: 1.548e-07; rel: 7.282e-08; norm: 1.054e-01; mom: 2.173e-03;
## best it: 177; best obj: 2.125e+00
## It: 178; obj: 2.125e+00; abs: 1.372e-07; rel: 6.453e-08; norm: 1.054e-01; mom: 2.037e-03;
## best it: 178; best obj: 2.125e+00
## It: 179; obj: 2.125e+00; abs: 1.217e-07; rel: 5.728e-08; norm: 1.054e-01; mom: 1.912e-03;
## best it: 179; best obj: 2.125e+00
## It: 180; obj: 2.125e+00; abs: 1.082e-07; rel: 5.091e-08; norm: 1.054e-01; mom: 1.795e-03;
## best it: 180; best obj: 2.125e+00
## It: 181; obj: 2.125e+00; abs: 9.628e-08; rel: 4.530e-08; norm: 1.054e-01; mom: 1.687e-03;
## best it: 181; best obj: 2.125e+00
## It: 182; obj: 2.125e+00; abs: 8.577e-08; rel: 4.035e-08; norm: 1.054e-01; mom: 1.586e-03;
## best it: 182; best obj: 2.125e+00
## It: 183; obj: 2.125e+00; abs: 7.648e-08; rel: 3.599e-08; norm: 1.054e-01; mom: 1.492e-03;
## best it: 183; best obj: 2.125e+00
## It: 184; obj: 2.125e+00; abs: 6.827e-08; rel: 3.212e-08; norm: 1.054e-01; mom: 1.404e-03;
## best it: 184; best obj: 2.125e+00
## It: 185; obj: 2.125e+00; abs: 6.098e-08; rel: 2.869e-08; norm: 1.054e-01; mom: 1.322e-03;
## best it: 185; best obj: 2.125e+00
## It: 186; obj: 2.125e+00; abs: 5.452e-08; rel: 2.565e-08; norm: 1.054e-01; mom: 1.245e-03;
## best it: 186; best obj: 2.125e+00
## It: 187; obj: 2.125e+00; abs: 4.877e-08; rel: 2.295e-08; norm: 1.054e-01; mom: 1.173e-03;
## best it: 187; best obj: 2.125e+00
## It: 188; obj: 2.125e+00; abs: 4.366e-08; rel: 2.054e-08; norm: 1.054e-01; mom: 1.105e-03;
## best it: 188; best obj: 2.125e+00
## It: 189; obj: 2.125e+00; abs: 3.911e-08; rel: 1.840e-08; norm: 1.054e-01; mom: 1.042e-03;
## best it: 189; best obj: 2.125e+00
## It: 190; obj: 2.125e+00; abs: 3.505e-08; rel: 1.649e-08; norm: 1.054e-01; mom: 9.822e-04;
## best it: 190; best obj: 2.125e+00
## It: 191; obj: 2.125e+00; abs: 3.144e-08; rel: 1.479e-08; norm: 1.054e-01; mom: 9.263e-04;
## best it: 191; best obj: 2.125e+00
## It: 192; obj: 2.125e+00; abs: 2.821e-08; rel: 1.327e-08; norm: 1.054e-01; mom: 8.737e-04;
## best it: 192; best obj: 2.125e+00

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## It: 193; obj: 2.125e+00; abs: 2.533e-08; rel: 1.192e-08; norm: 1.054e-01; mom: 8.244e-04;
## best it: 193; best obj: 2.125e+00
## It: 194; obj: 2.125e+00; abs: 2.275e-08; rel: 1.070e-08; norm: 1.054e-01; mom: 7.781e-04;
## best it: 194; best obj: 2.125e+00
## It: 195; obj: 2.125e+00; abs: 2.045e-08; rel: 9.620e-09; norm: 1.054e-01; mom: 7.345e-04;
## best it: 195; best obj: 2.125e+00
## It: 196; obj: 2.125e+00; abs: 1.838e-08; rel: 8.650e-09; norm: 1.054e-01; mom: 6.936e-04;
## best it: 196; best obj: 2.125e+00
## It: 197; obj: 2.125e+00; abs: 1.654e-08; rel: 7.781e-09; norm: 1.054e-01; mom: 6.551e-04;
## best it: 197; best obj: 2.125e+00
## It: 198; obj: 2.125e+00; abs: 1.488e-08; rel: 7.003e-09; norm: 1.054e-01; mom: 6.190e-04;
## best it: 198; best obj: 2.125e+00
## It: 199; obj: 2.125e+00; abs: 1.340e-08; rel: 6.306e-09; norm: 1.054e-01; mom: 5.850e-04;
## best it: 199; best obj: 2.125e+00
## It: 200; obj: 2.125e+00; abs: 1.207e-08; rel: 5.681e-09; norm: 1.054e-01; mom: 5.531e-04;
## best it: 200; best obj: 2.125e+00

## It: 201; obj: 2.125e+00; abs: 1.088e-08; rel: 5.120e-09; norm: 1.054e-01; mom: 5.232e-04;
## best it: 201; best obj: 2.125e+00
## It: 202; obj: 2.125e+00; abs: 9.813e-09; rel: 4.617e-09; norm: 1.054e-01; mom: 4.952e-04;
## best it: 202; best obj: 2.125e+00
## It: 203; obj: 2.125e+00; abs: 8.852e-09; rel: 4.165e-09; norm: 1.054e-01; mom: 4.688e-04;
## best it: 203; best obj: 2.125e+00
## It: 204; obj: 2.125e+00; abs: 7.989e-09; rel: 3.759e-09; norm: 1.054e-01; mom: 4.442e-04;
## best it: 204; best obj: 2.125e+00
## It: 205; obj: 2.125e+00; abs: 7.214e-09; rel: 3.394e-09; norm: 1.054e-01; mom: 4.211e-04;
## best it: 205; best obj: 2.125e+00
## It: 206; obj: 2.125e+00; abs: 6.516e-09; rel: 3.066e-09; norm: 1.054e-01; mom: 3.995e-04;
## best it: 206; best obj: 2.125e+00
## It: 207; obj: 2.125e+00; abs: 5.889e-09; rel: 2.771e-09; norm: 1.054e-01; mom: 3.794e-04;
## best it: 207; best obj: 2.125e+00
## It: 208; obj: 2.125e+00; abs: 5.325e-09; rel: 2.505e-09; norm: 1.054e-01; mom: 3.605e-04;
## best it: 208; best obj: 2.125e+00
## It: 209; obj: 2.125e+00; abs: 4.816e-09; rel: 2.266e-09; norm: 1.054e-01; mom: 3.429e-04;
## best it: 209; best obj: 2.125e+00
## It: 210; obj: 2.125e+00; abs: 4.359e-09; rel: 2.051e-09; norm: 1.054e-01; mom: 3.264e-04;
## best it: 210; best obj: 2.125e+00
## It: 211; obj: 2.125e+00; abs: 3.946e-09; rel: 1.857e-09; norm: 1.054e-01; mom: 3.111e-04;
## best it: 211; best obj: 2.125e+00
## It: 212; obj: 2.125e+00; abs: 3.574e-09; rel: 1.682e-09; norm: 1.054e-01; mom: 2.966e-04;
## best it: 212; best obj: 2.125e+00
## It: 213; obj: 2.125e+00; abs: 3.239e-09; rel: 1.524e-09; norm: 1.054e-01; mom: 2.831e-04;
## best it: 213; best obj: 2.125e+00
## It: 214; obj: 2.125e+00; abs: 2.936e-09; rel: 1.382e-09; norm: 1.054e-01; mom: 2.704e-04;
## best it: 214; best obj: 2.125e+00
## It: 215; obj: 2.125e+00; abs: 2.663e-09; rel: 1.253e-09; norm: 1.054e-01; mom: 2.585e-04;
## best it: 215; best obj: 2.125e+00
## It: 216; obj: 2.125e+00; abs: 2.416e-09; rel: 1.137e-09; norm: 1.054e-01; mom: 2.472e-04;
## best it: 216; best obj: 2.125e+00
## It: 217; obj: 2.125e+00; abs: 2.194e-09; rel: 1.032e-09; norm: 1.054e-01; mom: 2.366e-04;
## best it: 217; best obj: 2.125e+00
## It: 218; obj: 2.125e+00; abs: 1.992e-09; rel: 9.372e-10; norm: 1.054e-01; mom: 2.265e-04;
## best it: 218; best obj: 2.125e+00
## It: 219; obj: 2.125e+00; abs: 1.810e-09; rel: 8.516e-10; norm: 1.054e-01; mom: 2.170e-04;

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## best it: 219; best obj: 2.125e+00
## It: 220; obj: 2.125e+00; abs: 1.645e-09; rel: 7.741e-10; norm: 1.054e-01; mom: 2.079e-04;
## best it: 220; best obj: 2.125e+00
## It: 221; obj: 2.125e+00; abs: 1.496e-09; rel: 7.038e-10; norm: 1.054e-01; mom: 1.993e-04;
## best it: 221; best obj: 2.125e+00
## It: 222; obj: 2.125e+00; abs: 1.361e-09; rel: 6.403e-10; norm: 1.054e-01; mom: 1.911e-04;
## best it: 222; best obj: 2.125e+00
## It: 223; obj: 2.125e+00; abs: 1.238e-09; rel: 5.827e-10; norm: 1.054e-01; mom: 1.833e-04;
## best it: 223; best obj: 2.125e+00
## It: 224; obj: 2.125e+00; abs: 1.128e-09; rel: 5.306e-10; norm: 1.054e-01; mom: 1.758e-04;
## best it: 224; best obj: 2.125e+00
## It: 225; obj: 2.125e+00; abs: 1.027e-09; rel: 4.832e-10; norm: 1.054e-01; mom: 1.687e-04;
## best it: 225; best obj: 2.125e+00

## It: 226; obj: 2.125e+00; abs: 9.359e-10; rel: 4.403e-10; norm: 1.054e-01; mom: 1.619e-04;
## best it: 226; best obj: 2.125e+00
## It: 227; obj: 2.125e+00; abs: 8.533e-10; rel: 4.015e-10; norm: 1.054e-01; mom: 1.554e-04;
## best it: 227; best obj: 2.125e+00
## It: 228; obj: 2.125e+00; abs: 7.780e-10; rel: 3.660e-10; norm: 1.054e-01; mom: 1.492e-04;
## best it: 228; best obj: 2.125e+00
## It: 229; obj: 2.125e+00; abs: 7.099e-10; rel: 3.340e-10; norm: 1.054e-01; mom: 1.433e-04;
## best it: 229; best obj: 2.125e+00
## It: 230; obj: 2.125e+00; abs: 6.479e-10; rel: 3.048e-10; norm: 1.054e-01; mom: 1.376e-04;
## best it: 230; best obj: 2.125e+00
## It: 231; obj: 2.125e+00; abs: 5.914e-10; rel: 2.783e-10; norm: 1.054e-01; mom: 1.321e-04;
## best it: 231; best obj: 2.125e+00
## It: 232; obj: 2.125e+00; abs: 5.402e-10; rel: 2.542e-10; norm: 1.054e-01; mom: 1.269e-04;
## best it: 232; best obj: 2.125e+00
## It: 233; obj: 2.125e+00; abs: 4.937e-10; rel: 2.323e-10; norm: 1.054e-01; mom: 1.219e-04;
## best it: 233; best obj: 2.125e+00
## It: 234; obj: 2.125e+00; abs: 4.511e-10; rel: 2.122e-10; norm: 1.054e-01; mom: 1.171e-04;
## best it: 234; best obj: 2.125e+00
## It: 235; obj: 2.125e+00; abs: 4.126e-10; rel: 1.941e-10; norm: 1.054e-01; mom: 1.125e-04;
## best it: 235; best obj: 2.125e+00
## It: 236; obj: 2.125e+00; abs: 3.774e-10; rel: 1.775e-10; norm: 1.054e-01; mom: 1.081e-04;
## best it: 236; best obj: 2.125e+00
## It: 237; obj: 2.125e+00; abs: 3.453e-10; rel: 1.625e-10; norm: 1.054e-01; mom: 1.039e-04;
## best it: 237; best obj: 2.125e+00
## It: 238; obj: 2.125e+00; abs: 3.161e-10; rel: 1.487e-10; norm: 1.054e-01; mom: 9.986e-05;
## best it: 238; best obj: 2.125e+00
## It: 239; obj: 2.125e+00; abs: 2.894e-10; rel: 1.362e-10; norm: 1.054e-01; mom: 9.597e-05;
## best it: 239; best obj: 2.125e+00
## It: 240; obj: 2.125e+00; abs: 2.652e-10; rel: 1.248e-10; norm: 1.054e-01; mom: 9.224e-05;
## best it: 240; best obj: 2.125e+00
## It: 241; obj: 2.125e+00; abs: 2.428e-10; rel: 1.142e-10; norm: 1.054e-01; mom: 8.866e-05;
## best it: 241; best obj: 2.125e+00
## It: 242; obj: 2.125e+00; abs: 2.226e-10; rel: 1.047e-10; norm: 1.054e-01; mom: 8.523e-05;
## best it: 242; best obj: 2.125e+00
## It: 243; obj: 2.125e+00; abs: 2.042e-10; rel: 9.607e-11; norm: 1.054e-01; mom: 8.193e-05;
## best it: 243; best obj: 2.125e+00
## It: 244; obj: 2.125e+00; abs: 1.871e-10; rel: 8.803e-11; norm: 1.054e-01; mom: 7.877e-05;
## best it: 244; best obj: 2.125e+00
## It: 245; obj: 2.125e+00; abs: 1.718e-10; rel: 8.081e-11; norm: 1.054e-01; mom: 7.573e-05;
## best it: 245; best obj: 2.125e+00

```

```

## It: 246; obj: 2.125e+00; abs: 1.576e-10; rel: 7.416e-11; norm: 1.054e-01; mom: 7.281e-05;
## best it: 246; best obj: 2.125e+00
## It: 247; obj: 2.125e+00; abs: 1.445e-10; rel: 6.801e-11; norm: 1.054e-01; mom: 7.001e-05;
## best it: 247; best obj: 2.125e+00
## It: 248; obj: 2.125e+00; abs: 1.542e-10; rel: 7.255e-11; norm: 1.054e-01; mom: 1.077e-04;
## best it: 248; best obj: 2.125e+00
## It: 249; obj: 2.125e+00; abs: 1.491e-10; rel: 7.016e-11; norm: 1.054e-01; mom: 1.228e-04;
## best it: 249; best obj: 2.125e+00
## It: 250; obj: 2.125e+00; abs: 1.388e-10; rel: 6.529e-11; norm: 1.054e-01; mom: 1.269e-04;
## best it: 250; best obj: 2.125e+00

## It: 251; obj: 2.125e+00; abs: 1.266e-10; rel: 5.957e-11; norm: 1.054e-01; mom: 1.253e-04;
## best it: 251; best obj: 2.125e+00
## It: 252; obj: 2.125e+00; abs: 1.143e-10; rel: 5.380e-11; norm: 1.054e-01; mom: 1.208e-04;
## best it: 252; best obj: 2.125e+00
## It: 253; obj: 2.125e+00; abs: 1.025e-10; rel: 4.823e-11; norm: 1.054e-01; mom: 1.151e-04;
## best it: 253; best obj: 2.125e+00
## It: 254; obj: 2.125e+00; abs: 9.165e-11; rel: 4.312e-11; norm: 1.054e-01; mom: 1.091e-04;
## best it: 254; best obj: 2.125e+00
## It: 255; obj: 2.125e+00; abs: 8.194e-11; rel: 3.855e-11; norm: 1.054e-01; mom: 1.032e-04;
## best it: 255; best obj: 2.125e+00
## It: 256; obj: 2.125e+00; abs: 7.339e-11; rel: 3.453e-11; norm: 1.054e-01; mom: 9.759e-05;
## best it: 256; best obj: 2.125e+00
## It: 257; obj: 2.125e+00; abs: 6.569e-11; rel: 3.091e-11; norm: 1.054e-01; mom: 9.223e-05;
## best it: 257; best obj: 2.125e+00
## It: 258; obj: 2.125e+00; abs: 5.884e-11; rel: 2.768e-11; norm: 1.054e-01; mom: 8.719e-05;
## best it: 258; best obj: 2.125e+00
## It: 259; obj: 2.125e+00; abs: 5.263e-11; rel: 2.476e-11; norm: 1.054e-01; mom: 8.247e-05;
## best it: 259; best obj: 2.125e+00
## It: 260; obj: 2.125e+00; abs: 4.721e-11; rel: 2.221e-11; norm: 1.054e-01; mom: 7.807e-05;
## best it: 260; best obj: 2.125e+00
## It: 261; obj: 2.125e+00; abs: 4.226e-11; rel: 1.988e-11; norm: 1.054e-01; mom: 7.398e-05;
## best it: 261; best obj: 2.125e+00
## It: 262; obj: 2.125e+00; abs: 3.786e-11; rel: 1.781e-11; norm: 1.054e-01; mom: 7.016e-05;
## best it: 262; best obj: 2.125e+00
## It: 263; obj: 2.125e+00; abs: 3.402e-11; rel: 1.601e-11; norm: 1.054e-01; mom: 6.656e-05;
## best it: 263; best obj: 2.125e+00
## It: 264; obj: 2.125e+00; abs: 3.045e-11; rel: 1.432e-11; norm: 1.054e-01; mom: 6.317e-05;
## best it: 264; best obj: 2.125e+00
## It: 265; obj: 2.125e+00; abs: 2.734e-11; rel: 1.286e-11; norm: 1.054e-01; mom: 5.996e-05;
## best it: 265; best obj: 2.125e+00
## It: 266; obj: 2.125e+00; abs: 2.457e-11; rel: 1.156e-11; norm: 1.054e-01; mom: 5.693e-05;
## best it: 266; best obj: 2.125e+00
## It: 267; obj: 2.125e+00; abs: 2.203e-11; rel: 1.037e-11; norm: 1.054e-01; mom: 5.406e-05;
## best it: 267; best obj: 2.125e+00
## It: 268; obj: 2.125e+00; abs: 1.993e-11; rel: 9.377e-12; norm: 1.054e-01; mom: 5.134e-05;
## best it: 268; best obj: 2.125e+00
## It: 269; obj: 2.125e+00; abs: 1.770e-11; rel: 8.329e-12; norm: 1.054e-01; mom: 4.875e-05;
## best it: 269; best obj: 2.125e+00
## It: 270; obj: 2.125e+00; abs: 1.606e-11; rel: 7.557e-12; norm: 1.054e-01; mom: 4.630e-05;
## best it: 270; best obj: 2.125e+00
## It: 271; obj: 2.125e+00; abs: 1.442e-11; rel: 6.787e-12; norm: 1.054e-01; mom: 4.397e-05;
## best it: 271; best obj: 2.125e+00
## It: 272; obj: 2.125e+00; abs: 1.293e-11; rel: 6.082e-12; norm: 1.054e-01; mom: 4.175e-05;

```

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## best it: 272; best obj: 2.125e+00
## It: 273; obj: 2.125e+00; abs: 1.155e-11; rel: 5.433e-12; norm: 1.054e-01; mom: 3.965e-05;
## best it: 273; best obj: 2.125e+00
## It: 274; obj: 2.125e+00; abs: 1.056e-11; rel: 4.967e-12; norm: 1.054e-01; mom: 3.766e-05;
## best it: 274; best obj: 2.125e+00
## It: 275; obj: 2.125e+00; abs: 9.402e-12; rel: 4.424e-12; norm: 1.054e-01; mom: 3.576e-05;
## best it: 275; best obj: 2.125e+00

## It: 276; obj: 2.125e+00; abs: 8.444e-12; rel: 3.973e-12; norm: 1.054e-01; mom: 3.396e-05;
## best it: 276; best obj: 2.125e+00
## It: 277; obj: 2.125e+00; abs: 7.622e-12; rel: 3.586e-12; norm: 1.054e-01; mom: 3.226e-05;
## best it: 277; best obj: 2.125e+00
## It: 278; obj: 2.125e+00; abs: 6.846e-12; rel: 3.221e-12; norm: 1.054e-01; mom: 3.063e-05;
## best it: 278; best obj: 2.125e+00
## It: 279; obj: 2.125e+00; abs: 6.124e-12; rel: 2.881e-12; norm: 1.054e-01; mom: 2.909e-05;
## best it: 279; best obj: 2.125e+00
## It: 280; obj: 2.125e+00; abs: 5.588e-12; rel: 2.629e-12; norm: 1.054e-01; mom: 2.763e-05;
## best it: 280; best obj: 2.125e+00
## It: 281; obj: 2.125e+00; abs: 4.981e-12; rel: 2.344e-12; norm: 1.054e-01; mom: 2.624e-05;
## best it: 281; best obj: 2.125e+00
## It: 282; obj: 2.125e+00; abs: 4.421e-12; rel: 2.080e-12; norm: 1.054e-01; mom: 2.492e-05;
## best it: 282; best obj: 2.125e+00
## It: 283; obj: 2.125e+00; abs: 4.043e-12; rel: 1.902e-12; norm: 1.054e-01; mom: 2.367e-05;
## best it: 283; best obj: 2.125e+00
## It: 284; obj: 2.125e+00; abs: 3.626e-12; rel: 1.706e-12; norm: 1.054e-01; mom: 2.248e-05;
## best it: 284; best obj: 2.125e+00
## It: 285; obj: 2.125e+00; abs: 3.332e-12; rel: 1.568e-12; norm: 1.054e-01; mom: 2.135e-05;
## best it: 285; best obj: 2.125e+00
## It: 286; obj: 2.125e+00; abs: 2.888e-12; rel: 1.359e-12; norm: 1.054e-01; mom: 2.028e-05;
## best it: 286; best obj: 2.125e+00
## It: 287; obj: 2.125e+00; abs: 2.714e-12; rel: 1.277e-12; norm: 1.054e-01; mom: 1.927e-05;
## best it: 287; best obj: 2.125e+00
## It: 288; obj: 2.125e+00; abs: 2.468e-12; rel: 1.161e-12; norm: 1.054e-01; mom: 1.830e-05;
## best it: 288; best obj: 2.125e+00
## It: 289; obj: 2.125e+00; abs: 2.076e-12; rel: 9.766e-13; norm: 1.054e-01; mom: 1.738e-05;
## best it: 289; best obj: 2.125e+00
## It: 290; obj: 2.125e+00; abs: 2.027e-12; rel: 9.538e-13; norm: 1.054e-01; mom: 1.651e-05;
## best it: 290; best obj: 2.125e+00
## It: 291; obj: 2.125e+00; abs: 1.693e-12; rel: 7.967e-13; norm: 1.054e-01; mom: 1.568e-05;
## best it: 291; best obj: 2.125e+00
## It: 292; obj: 2.125e+00; abs: 1.704e-12; rel: 8.019e-13; norm: 1.054e-01; mom: 1.489e-05;
## best it: 292; best obj: 2.125e+00
## It: 293; obj: 2.125e+00; abs: 1.362e-12; rel: 6.408e-13; norm: 1.054e-01; mom: 1.415e-05;
## best it: 293; best obj: 2.125e+00
## It: 294; obj: 2.125e+00; abs: 1.254e-12; rel: 5.898e-13; norm: 1.054e-01; mom: 1.344e-05;
## best it: 294; best obj: 2.125e+00
## It: 295; obj: 2.125e+00; abs: 1.195e-12; rel: 5.625e-13; norm: 1.054e-01; mom: 1.277e-05;
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## It: 296; obj: 2.125e+00; abs: 9.717e-13; rel: 4.572e-13; norm: 1.054e-01; mom: 1.213e-05;
## best it: 296; best obj: 2.125e+00
## It: 297; obj: 2.125e+00; abs: 9.526e-13; rel: 4.482e-13; norm: 1.054e-01; mom: 1.152e-05;
## best it: 297; best obj: 2.125e+00
## It: 298; obj: 2.125e+00; abs: 8.509e-13; rel: 4.003e-13; norm: 1.054e-01; mom: 1.094e-05;
## best it: 298; best obj: 2.125e+00

```

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## It: 299; obj: 2.125e+00; abs: 7.652e-13; rel: 3.600e-13; norm: 1.054e-01; mom: 1.040e-05;
## best it: 299; best obj: 2.125e+00
## It: 300; obj: 2.125e+00; abs: 7.745e-13; rel: 3.644e-13; norm: 1.054e-01; mom: 9.869e-06;
## best it: 300; best obj: 2.125e+00

## It: 301; obj: 2.125e+00; abs: 5.684e-13; rel: 2.674e-13; norm: 1.054e-01; mom: 9.384e-06;
## best it: 301; best obj: 2.125e+00
## It: 302; obj: 2.125e+00; abs: 5.560e-13; rel: 2.616e-13; norm: 1.054e-01; mom: 8.912e-06;
## best it: 302; best obj: 2.125e+00
## It: 303; obj: 2.125e+00; abs: 4.765e-13; rel: 2.242e-13; norm: 1.054e-01; mom: 8.460e-06;
## best it: 303; best obj: 2.125e+00
## It: 304; obj: 2.125e+00; abs: 4.299e-13; rel: 2.023e-13; norm: 1.054e-01; mom: 8.050e-06;
## best it: 304; best obj: 2.125e+00
## It: 305; obj: 2.125e+00; abs: 5.107e-13; rel: 2.403e-13; norm: 1.054e-01; mom: 7.640e-06;
## best it: 305; best obj: 2.125e+00
## It: 306; obj: 2.125e+00; abs: 3.944e-13; rel: 1.855e-13; norm: 1.054e-01; mom: 7.253e-06;
## best it: 306; best obj: 2.125e+00
## It: 307; obj: 2.125e+00; abs: 3.122e-13; rel: 1.469e-13; norm: 1.054e-01; mom: 6.910e-06;
## best it: 307; best obj: 2.125e+00
## It: 308; obj: 2.125e+00; abs: 2.167e-13; rel: 1.020e-13; norm: 1.054e-01; mom: 6.550e-06;
## best it: 308; best obj: 2.125e+00
## It: 309; obj: 2.125e+00; abs: 3.459e-13; rel: 1.628e-13; norm: 1.054e-01; mom: 6.221e-06;
## best it: 309; best obj: 2.125e+00
## It: 310; obj: 2.125e+00; abs: 2.256e-13; rel: 1.061e-13; norm: 1.054e-01; mom: 5.937e-06;
## best it: 310; best obj: 2.125e+00
## It: 311; obj: 2.125e+00; abs: 1.976e-13; rel: 9.298e-14; norm: 1.054e-01; mom: 5.615e-06;
## best it: 311; best obj: 2.125e+00
## It: 312; obj: 2.125e+00; abs: 1.923e-13; rel: 9.047e-14; norm: 1.054e-01; mom: 5.342e-06;
## best it: 312; best obj: 2.125e+00
## It: 313; obj: 2.125e+00; abs: 2.451e-13; rel: 1.153e-13; norm: 1.054e-01; mom: 5.111e-06;
## best it: 313; best obj: 2.125e+00
## It: 314; obj: 2.125e+00; abs: 1.399e-13; rel: 6.582e-14; norm: 1.054e-01; mom: 4.813e-06;
## best it: 314; best obj: 2.125e+00
## It: 315; obj: 2.125e+00; abs: 1.643e-13; rel: 7.731e-14; norm: 1.054e-01; mom: 4.597e-06;
## best it: 315; best obj: 2.125e+00
## It: 316; obj: 2.125e+00; abs: 7.505e-14; rel: 3.531e-14; norm: 1.054e-01; mom: 4.411e-06;
## best it: 316; best obj: 2.125e+00
## It: 317; obj: 2.125e+00; abs: 1.457e-13; rel: 6.853e-14; norm: 1.054e-01; mom: 4.125e-06;
## best it: 317; best obj: 2.125e+00
## It: 318; obj: 2.125e+00; abs: 9.592e-14; rel: 4.513e-14; norm: 1.054e-01; mom: 3.975e-06;
## best it: 318; best obj: 2.125e+00
## It: 319; obj: 2.125e+00; abs: 9.459e-14; rel: 4.451e-14; norm: 1.054e-01; mom: 3.823e-06;
## best it: 319; best obj: 2.125e+00
## It: 320; obj: 2.125e+00; abs: 7.239e-14; rel: 3.406e-14; norm: 1.054e-01; mom: 3.535e-06;
## best it: 320; best obj: 2.125e+00
## It: 321; obj: 2.125e+00; abs: 1.164e-13; rel: 5.474e-14; norm: 1.054e-01; mom: 3.475e-06;
## best it: 321; best obj: 2.125e+00
## It: 322; obj: 2.125e+00; abs: 5.151e-14; rel: 2.424e-14; norm: 1.054e-01; mom: 3.335e-06;
## best it: 322; best obj: 2.125e+00
## It: 323; obj: 2.125e+00; abs: 9.592e-14; rel: 4.513e-14; norm: 1.054e-01; mom: 3.031e-06;
## best it: 323; best obj: 2.125e+00
## It: 324; obj: 2.125e+00; abs: 4.308e-14; rel: 2.027e-14; norm: 1.054e-01; mom: 3.120e-06;
## best it: 323; best obj: 2.125e+00
## It: 325; obj: 2.125e+00; abs: 1.048e-13; rel: 4.931e-14; norm: 1.054e-01; mom: 2.937e-06;

```

```

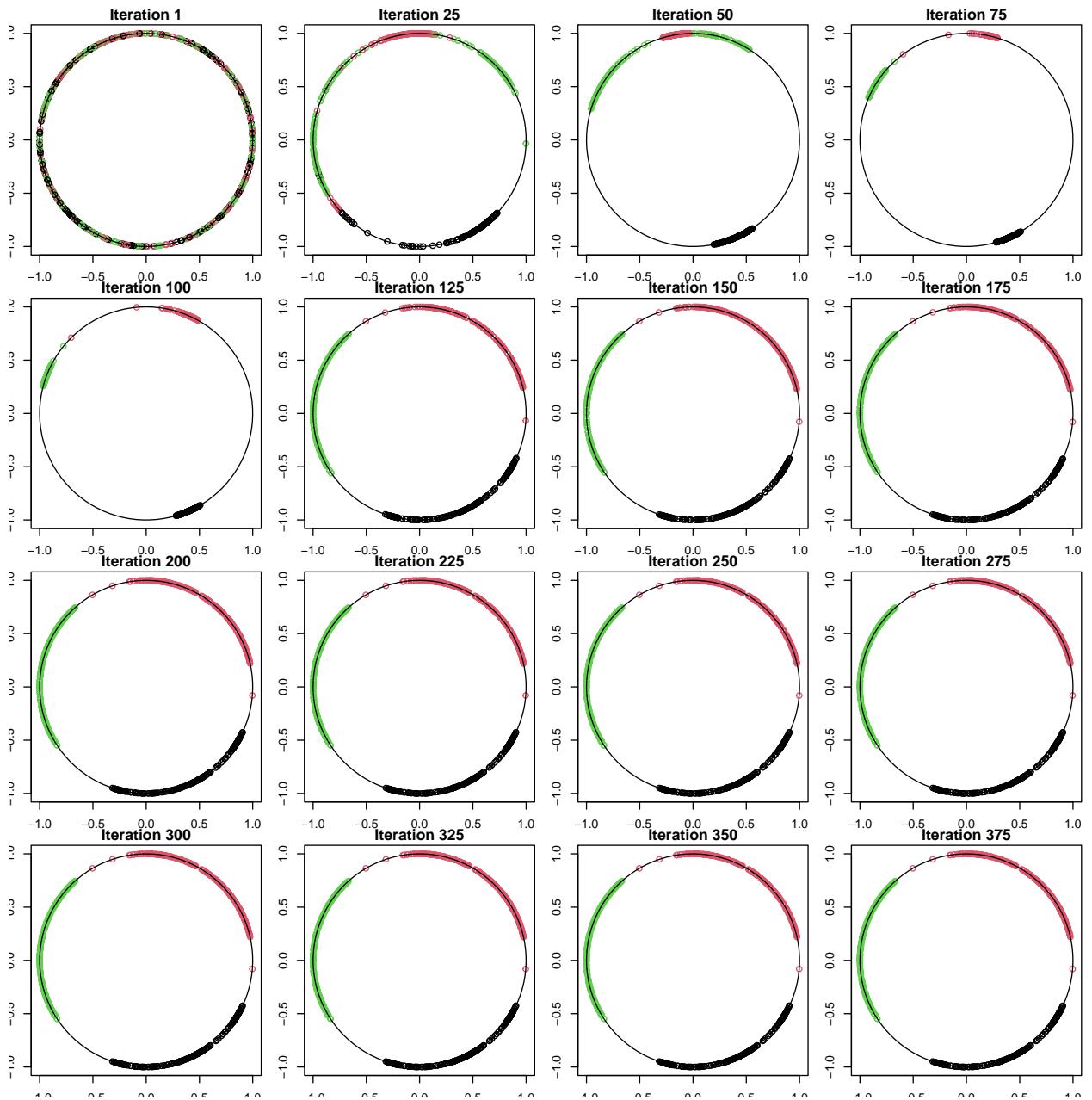
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## It: 326; obj: 2.125e+00; abs: 1.510e-14; rel: 7.104e-15; norm: 1.054e-01; mom: 2.608e-06;
## best it: 326; best obj: 2.125e+00
## It: 327; obj: 2.125e+00; abs: 3.419e-14; rel: 1.609e-14; norm: 1.054e-01; mom: 2.983e-06;
## best it: 327; best obj: 2.125e+00
## It: 328; obj: 2.125e+00; abs: 7.061e-14; rel: 3.322e-14; norm: 1.054e-01; mom: 2.614e-06;
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## It: 329; obj: 2.125e+00; abs: 6.528e-14; rel: 3.071e-14; norm: 1.054e-01; mom: 2.269e-06;
## best it: 329; best obj: 2.125e+00
## It: 330; obj: 2.125e+00; abs: 1.199e-14; rel: 5.641e-15; norm: 1.054e-01; mom: 3.100e-06;
## best it: 330; best obj: 2.125e+00
## It: 331; obj: 2.125e+00; abs: 4.619e-14; rel: 2.173e-14; norm: 1.054e-01; mom: 2.342e-06;
## best it: 331; best obj: 2.125e+00
## It: 332; obj: 2.125e+00; abs: 9.326e-15; rel: 4.388e-15; norm: 1.054e-01; mom: 2.056e-06;
## best it: 332; best obj: 2.125e+00
## It: 333; obj: 2.125e+00; abs: 3.553e-15; rel: 1.672e-15; norm: 1.054e-01; mom: 3.366e-06;
## best it: 332; best obj: 2.125e+00
## It: 334; obj: 2.125e+00; abs: 2.309e-14; rel: 1.087e-14; norm: 1.054e-01; mom: 2.084e-06;
## best it: 334; best obj: 2.125e+00
## It: 335; obj: 2.125e+00; abs: 4.441e-15; rel: 2.089e-15; norm: 1.054e-01; mom: 2.142e-06;
## best it: 334; best obj: 2.125e+00
## It: 336; obj: 2.125e+00; abs: 9.948e-14; rel: 4.680e-14; norm: 1.054e-01; mom: 3.687e-06;
## best it: 336; best obj: 2.125e+00
## It: 337; obj: 2.125e+00; abs: 2.309e-14; rel: 1.087e-14; norm: 1.054e-01; mom: 1.808e-06;
## best it: 336; best obj: 2.125e+00
## It: 338; obj: 2.125e+00; abs: 5.329e-14; rel: 2.507e-14; norm: 1.054e-01; mom: 2.601e-06;
## best it: 336; best obj: 2.125e+00
## It: 339; obj: 2.125e+00; abs: 5.151e-14; rel: 2.424e-14; norm: 1.054e-01; mom: 4.013e-06;
## best it: 336; best obj: 2.125e+00
## It: 340; obj: 2.125e+00; abs: 5.418e-14; rel: 2.549e-14; norm: 1.054e-01; mom: 1.498e-06;
## best it: 340; best obj: 2.125e+00
## It: 341; obj: 2.125e+00; abs: 9.548e-14; rel: 4.492e-14; norm: 1.054e-01; mom: 3.247e-06;
## best it: 340; best obj: 2.125e+00
## It: 342; obj: 2.125e+00; abs: 3.686e-14; rel: 1.734e-14; norm: 1.054e-01; mom: 4.316e-06;
## best it: 340; best obj: 2.125e+00
## It: 343; obj: 2.125e+00; abs: 6.706e-14; rel: 3.155e-14; norm: 1.054e-01; mom: 1.202e-06;
## best it: 343; best obj: 2.125e+00
## It: 344; obj: 2.125e+00; abs: 9.504e-14; rel: 4.471e-14; norm: 1.054e-01; mom: 3.998e-06;
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## It: 345; obj: 2.125e+00; abs: 5.596e-14; rel: 2.633e-14; norm: 1.054e-01; mom: 4.567e-06;
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## It: 346; obj: 2.125e+00; abs: 1.545e-13; rel: 7.271e-14; norm: 1.054e-01; mom: 1.001e-06;
## best it: 346; best obj: 2.125e+00
## It: 347; obj: 2.125e+00; abs: 8.527e-14; rel: 4.012e-14; norm: 1.054e-01; mom: 4.833e-06;
## best it: 346; best obj: 2.125e+00
## It: 348; obj: 2.125e+00; abs: 3.331e-14; rel: 1.567e-14; norm: 1.054e-01; mom: 4.742e-06;
## best it: 346; best obj: 2.125e+00
## It: 349; obj: 2.125e+00; abs: 4.441e-14; rel: 2.089e-14; norm: 1.054e-01; mom: 1.013e-06;
## best it: 346; best obj: 2.125e+00
## It: 350; obj: 2.125e+00; abs: 4.574e-14; rel: 2.152e-14; norm: 1.054e-01; mom: 5.732e-06;
## best it: 346; best obj: 2.125e+00
## It: 351; obj: 2.125e+00; abs: 2.620e-14; rel: 1.233e-14; norm: 1.054e-01; mom: 4.812e-06;
## best it: 346; best obj: 2.125e+00

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## It: 352; obj: 2.125e+00; abs: 7.416e-14; rel: 3.489e-14; norm: 1.054e-01; mom: 1.689e-06;
## best it: 352; best obj: 2.125e+00
## It: 353; obj: 2.125e+00; abs: 9.681e-14; rel: 4.555e-14; norm: 1.054e-01; mom: 6.680e-06;
## best it: 352; best obj: 2.125e+00
## It: 354; obj: 2.125e+00; abs: 1.998e-14; rel: 9.402e-15; norm: 1.054e-01; mom: 4.748e-06;
## best it: 352; best obj: 2.125e+00
## It: 355; obj: 2.125e+00; abs: 5.285e-14; rel: 2.486e-14; norm: 1.054e-01; mom: 2.732e-06;
## best it: 352; best obj: 2.125e+00
## It: 356; obj: 2.125e+00; abs: 1.283e-13; rel: 6.038e-14; norm: 1.054e-01; mom: 7.653e-06;
## best it: 352; best obj: 2.125e+00
## It: 357; obj: 2.125e+00; abs: 1.177e-13; rel: 5.537e-14; norm: 1.054e-01; mom: 4.516e-06;
## best it: 352; best obj: 2.125e+00
## It: 358; obj: 2.125e+00; abs: 5.684e-14; rel: 2.674e-14; norm: 1.054e-01; mom: 3.996e-06;
## best it: 352; best obj: 2.125e+00
## It: 359; obj: 2.125e+00; abs: 1.066e-13; rel: 5.015e-14; norm: 1.054e-01; mom: 8.627e-06;
## best it: 352; best obj: 2.125e+00
## It: 360; obj: 2.125e+00; abs: 2.216e-13; rel: 1.043e-13; norm: 1.054e-01; mom: 4.084e-06;
## best it: 360; best obj: 2.125e+00
## It: 361; obj: 2.125e+00; abs: 9.726e-14; rel: 4.576e-14; norm: 1.054e-01; mom: 5.467e-06;
## best it: 360; best obj: 2.125e+00
## It: 362; obj: 2.125e+00; abs: 1.985e-13; rel: 9.340e-14; norm: 1.054e-01; mom: 9.567e-06;
## best it: 360; best obj: 2.125e+00
## It: 363; obj: 2.125e+00; abs: 2.744e-13; rel: 1.291e-13; norm: 1.054e-01; mom: 3.419e-06;
## best it: 360; best obj: 2.125e+00
## It: 364; obj: 2.125e+00; abs: 2.083e-13; rel: 9.799e-14; norm: 1.054e-01; mom: 7.144e-06;
## best it: 360; best obj: 2.125e+00
## It: 365; obj: 2.125e+00; abs: 1.479e-13; rel: 6.958e-14; norm: 1.054e-01; mom: 1.044e-05;
## best it: 360; best obj: 2.125e+00
## It: 366; obj: 2.125e+00; abs: 4.099e-13; rel: 1.929e-13; norm: 1.054e-01; mom: 2.509e-06;
## best it: 366; best obj: 2.125e+00
## It: 367; obj: 2.125e+00; abs: 3.499e-13; rel: 1.646e-13; norm: 1.054e-01; mom: 9.018e-06;
## best it: 366; best obj: 2.125e+00
## It: 368; obj: 2.125e+00; abs: 2.531e-14; rel: 1.191e-14; norm: 1.054e-01; mom: 1.119e-05;
## best it: 366; best obj: 2.125e+00
## It: 369; obj: 2.125e+00; abs: 3.624e-13; rel: 1.705e-13; norm: 1.054e-01; mom: 1.461e-06;
## best it: 366; best obj: 2.125e+00
## It: 370; obj: 2.125e+00; abs: 4.312e-13; rel: 2.029e-13; norm: 1.054e-01; mom: 1.108e-05;
## best it: 366; best obj: 2.125e+00
## It: 371; obj: 2.125e+00; abs: 3.331e-14; rel: 1.567e-14; norm: 1.054e-01; mom: 1.176e-05;
## best it: 366; best obj: 2.125e+00
## It: 372; obj: 2.125e+00; abs: 4.037e-13; rel: 1.899e-13; norm: 1.054e-01; mom: 1.340e-06;
## best it: 366; best obj: 2.125e+00
## It: 373; obj: 2.125e+00; abs: 6.506e-13; rel: 3.061e-13; norm: 1.054e-01; mom: 1.330e-05;
## best it: 366; best obj: 2.125e+00
## It: 374; obj: 2.125e+00; abs: 2.278e-13; rel: 1.072e-13; norm: 1.054e-01; mom: 1.210e-05;
## best it: 366; best obj: 2.125e+00
## It: 375; obj: 2.125e+00; abs: 3.690e-13; rel: 1.736e-13; norm: 1.054e-01; mom: 3.003e-06;
## best it: 366; best obj: 2.125e+00

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## It: 376; obj: 2.125e+00; abs: 8.740e-13; rel: 4.112e-13; norm: 1.054e-01; mom: 1.566e-05;
## best it: 366; best obj: 2.125e+00
## It: 377; obj: 2.125e+00; abs: 4.783e-13; rel: 2.250e-13; norm: 1.054e-01; mom: 1.213e-05;
## best it: 366; best obj: 2.125e+00
## It: 378; obj: 2.125e+00; abs: 2.691e-13; rel: 1.266e-13; norm: 1.054e-01; mom: 5.436e-06;
## best it: 366; best obj: 2.125e+00
## It: 379; obj: 2.125e+00; abs: 9.219e-13; rel: 4.338e-13; norm: 1.054e-01; mom: 1.811e-05;
## best it: 366; best obj: 2.125e+00
## It: 380; obj: 2.125e+00; abs: 7.403e-13; rel: 3.483e-13; norm: 1.054e-01; mom: 1.178e-05;
## best it: 366; best obj: 2.125e+00
## It: 381; obj: 2.125e+00; abs: 6.661e-15; rel: 3.134e-15; norm: 1.054e-01; mom: 8.398e-06;
## best it: 366; best obj: 2.125e+00
## It: 382; obj: 2.125e+00; abs: 1.123e-12; rel: 5.282e-13; norm: 1.054e-01; mom: 2.059e-05;
## best it: 366; best obj: 2.125e+00

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## It: 383; obj: 2.125e+00; abs: 1.173e-12; rel: 5.518e-13; norm: 1.054e-01; mom: 1.095e-05;
## best it: 366; best obj: 2.125e+00
## It: 384; obj: 2.125e+00; abs: 3.793e-13; rel: 1.784e-13; norm: 1.054e-01; mom: 1.187e-05;
## best it: 366; best obj: 2.125e+00
## It: 385; obj: 2.125e+00; abs: 1.074e-12; rel: 5.052e-13; norm: 1.054e-01; mom: 2.303e-05;
## best it: 366; best obj: 2.125e+00
## It: 386; obj: 2.125e+00; abs: 1.562e-12; rel: 7.351e-13; norm: 1.054e-01; mom: 9.582e-06;
## best it: 366; best obj: 2.125e+00
## It: 387; obj: 2.125e+00; abs: 8.762e-13; rel: 4.122e-13; norm: 1.054e-01; mom: 1.586e-05;
## best it: 366; best obj: 2.125e+00
## It: 388; obj: 2.125e+00; abs: 9.996e-13; rel: 4.703e-13; norm: 1.054e-01; mom: 2.534e-05;
## best it: 366; best obj: 2.125e+00
## It: 389; obj: 2.125e+00; abs: 1.941e-12; rel: 9.131e-13; norm: 1.054e-01; mom: 7.592e-06;
## best it: 366; best obj: 2.125e+00
## It: 390; obj: 2.125e+00; abs: 1.533e-12; rel: 7.215e-13; norm: 1.054e-01; mom: 2.036e-05;
## best it: 366; best obj: 2.125e+00
## It: 391; obj: 2.125e+00; abs: 6.710e-13; rel: 3.157e-13; norm: 1.054e-01; mom: 2.741e-05;
## best it: 366; best obj: 2.125e+00
## It: 392; obj: 2.125e+00; abs: 2.309e-12; rel: 1.087e-12; norm: 1.054e-01; mom: 5.018e-06;
## best it: 366; best obj: 2.125e+00
## It: 393; obj: 2.125e+00; abs: 2.433e-12; rel: 1.145e-12; norm: 1.054e-01; mom: 2.535e-05;
## best it: 366; best obj: 2.125e+00
## It: 394; obj: 2.125e+00; abs: 1.168e-13; rel: 5.495e-14; norm: 1.054e-01; mom: 2.911e-05;
## best it: 366; best obj: 2.125e+00
## It: 395; obj: 2.125e+00; abs: 2.450e-12; rel: 1.153e-12; norm: 1.054e-01; mom: 2.891e-06;
## best it: 366; best obj: 2.125e+00
## It: 396; obj: 2.125e+00; abs: 3.437e-12; rel: 1.617e-12; norm: 1.054e-01; mom: 3.078e-05;
## best it: 366; best obj: 2.125e+00
## It: 397; obj: 2.125e+00; abs: 9.406e-13; rel: 4.425e-13; norm: 1.054e-01; mom: 3.030e-05;
## best it: 366; best obj: 2.125e+00
## It: 398; obj: 2.125e+00; abs: 2.362e-12; rel: 1.111e-12; norm: 1.054e-01; mom: 5.086e-06;
## best it: 366; best obj: 2.125e+00
## It: 399; obj: 2.125e+00; abs: 4.531e-12; rel: 2.132e-12; norm: 1.054e-01; mom: 3.660e-05;
## best it: 366; best obj: 2.125e+00
## It: 400; obj: 2.125e+00; abs: 2.148e-12; rel: 1.010e-12; norm: 1.054e-01; mom: 3.080e-05;
## best it: 366; best obj: 2.125e+00

## It: 401; obj: 2.125e+00; abs: 1.859e-12; rel: 8.748e-13; norm: 1.054e-01; mom: 1.045e-05;
## best it: 366; best obj: 2.125e+00
## It: 402; obj: 2.125e+00; abs: 5.601e-12; rel: 2.635e-12; norm: 1.054e-01; mom: 4.270e-05;
## best it: 366; best obj: 2.125e+00
## It: 403; obj: 2.125e+00; abs: 3.953e-12; rel: 1.860e-12; norm: 1.054e-01; mom: 3.042e-05;
## best it: 366; best obj: 2.125e+00
## It: 404; obj: 2.125e+00; abs: 8.495e-13; rel: 3.997e-13; norm: 1.054e-01; mom: 1.729e-05;
## best it: 366; best obj: 2.125e+00
## It: 405; obj: 2.125e+00; abs: 6.530e-12; rel: 3.072e-12; norm: 1.054e-01; mom: 4.897e-05;
## best it: 366; best obj: 2.125e+00
## It: 406; obj: 2.125e+00; abs: 6.045e-12; rel: 2.844e-12; norm: 1.054e-01; mom: 2.897e-05;
## best it: 366; best obj: 2.125e+00
## It: 407; obj: 2.125e+00; abs: 1.031e-12; rel: 4.852e-13; norm: 1.054e-01; mom: 2.543e-05;
## best it: 366; best obj: 2.125e+00
## It: 408; obj: 2.125e+00; abs: 7.002e-12; rel: 3.294e-12; norm: 1.054e-01; mom: 5.523e-05;
## best it: 366; best obj: 2.125e+00
## It: 409; obj: 2.125e+00; abs: 8.561e-12; rel: 4.028e-12; norm: 1.054e-01; mom: 2.623e-05;

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## best it: 366; best obj: 2.125e+00
## It: 410; obj: 2.125e+00; abs: 3.834e-12; rel: 1.804e-12; norm: 1.054e-01; mom: 3.488e-05;
## best it: 366; best obj: 2.125e+00
## It: 411; obj: 2.125e+00; abs: 6.700e-12; rel: 3.152e-12; norm: 1.054e-01; mom: 6.128e-05;
## best it: 366; best obj: 2.125e+00
## It: 412; obj: 2.125e+00; abs: 1.116e-11; rel: 5.253e-12; norm: 1.054e-01; mom: 2.200e-05;
## best it: 366; best obj: 2.125e+00
## It: 413; obj: 2.125e+00; abs: 7.674e-12; rel: 3.611e-12; norm: 1.054e-01; mom: 4.562e-05;
## best it: 366; best obj: 2.125e+00
## It: 414; obj: 2.125e+00; abs: 5.430e-12; rel: 2.555e-12; norm: 1.054e-01; mom: 6.687e-05;
## best it: 366; best obj: 2.125e+00
## It: 415; obj: 2.125e+00; abs: 1.361e-11; rel: 6.403e-12; norm: 1.054e-01; mom: 1.618e-05;
## best it: 366; best obj: 2.125e+00
## It: 416; obj: 2.125e+00; abs: 1.271e-11; rel: 5.981e-12; norm: 1.054e-01; mom: 5.763e-05;
## best it: 366; best obj: 2.125e+00
## It: 417; obj: 2.125e+00; abs: 2.475e-12; rel: 1.165e-12; norm: 1.054e-01; mom: 7.170e-05;
## best it: 366; best obj: 2.125e+00
## It: 418; obj: 2.125e+00; abs: 1.529e-11; rel: 7.194e-12; norm: 1.054e-01; mom: 9.410e-06;
## best it: 366; best obj: 2.125e+00
## It: 419; obj: 2.125e+00; abs: 1.866e-11; rel: 8.780e-12; norm: 1.054e-01; mom: 7.084e-05;
## best it: 366; best obj: 2.125e+00
## It: 420; obj: 2.125e+00; abs: 2.321e-12; rel: 1.092e-12; norm: 1.054e-01; mom: 7.541e-05;
## best it: 366; best obj: 2.125e+00
## It: 421; obj: 2.125e+00; abs: 1.563e-11; rel: 7.352e-12; norm: 1.054e-01; mom: 8.414e-06;
## best it: 366; best obj: 2.125e+00
## It: 422; obj: 2.125e+00; abs: 2.549e-11; rel: 1.199e-11; norm: 1.054e-01; mom: 8.511e-05;
## best it: 366; best obj: 2.125e+00
## It: 423; obj: 2.125e+00; abs: 9.563e-12; rel: 4.499e-12; norm: 1.054e-01; mom: 7.762e-05;
## best it: 366; best obj: 2.125e+00
## It: 424; obj: 2.125e+00; abs: 1.395e-11; rel: 6.562e-12; norm: 1.054e-01; mom: 1.901e-05;
## best it: 366; best obj: 2.125e+00
## It: 425; obj: 2.125e+00; abs: 3.267e-11; rel: 1.537e-11; norm: 1.054e-01; mom: 1.002e-04;
## best it: 366; best obj: 2.125e+00

## It: 426; obj: 2.125e+00; abs: 1.942e-11; rel: 9.137e-12; norm: 1.054e-01; mom: 7.786e-05;
## best it: 366; best obj: 2.125e+00
## It: 427; obj: 2.125e+00; abs: 8.952e-12; rel: 4.212e-12; norm: 1.054e-01; mom: 3.456e-05;
## best it: 366; best obj: 2.125e+00
## It: 428; obj: 2.125e+00; abs: 3.902e-11; rel: 1.836e-11; norm: 1.054e-01; mom: 1.159e-04;
## best it: 366; best obj: 2.125e+00
## It: 429; obj: 2.125e+00; abs: 3.190e-11; rel: 1.501e-11; norm: 1.054e-01; mom: 7.563e-05;
## best it: 366; best obj: 2.125e+00
## It: 430; obj: 2.125e+00; abs: 2.509e-13; rel: 1.181e-13; norm: 1.054e-01; mom: 5.352e-05;
## best it: 366; best obj: 2.125e+00
## It: 431; obj: 2.125e+00; abs: 4.358e-11; rel: 2.050e-11; norm: 1.054e-01; mom: 1.319e-04;
## best it: 366; best obj: 2.125e+00
## It: 432; obj: 2.125e+00; abs: 4.675e-11; rel: 2.200e-11; norm: 1.054e-01; mom: 7.042e-05;
## best it: 366; best obj: 2.125e+00
## It: 433; obj: 2.125e+00; abs: 1.497e-11; rel: 7.042e-12; norm: 1.054e-01; mom: 7.576e-05;
## best it: 366; best obj: 2.125e+00
## It: 434; obj: 2.125e+00; abs: 4.465e-11; rel: 2.101e-11; norm: 1.054e-01; mom: 1.475e-04;
## best it: 366; best obj: 2.125e+00
## It: 435; obj: 2.125e+00; abs: 6.319e-11; rel: 2.973e-11; norm: 1.054e-01; mom: 6.168e-05;
## best it: 366; best obj: 2.125e+00

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## It: 436; obj: 2.125e+00; abs: 3.592e-11; rel: 1.690e-11; norm: 1.054e-01; mom: 1.013e-04;
## best it: 366; best obj: 2.125e+00
## It: 437; obj: 2.125e+00; abs: 3.980e-11; rel: 1.873e-11; norm: 1.054e-01; mom: 1.624e-04;
## best it: 366; best obj: 2.125e+00
## It: 438; obj: 2.125e+00; abs: 7.942e-11; rel: 3.737e-11; norm: 1.054e-01; mom: 4.899e-05;
## best it: 366; best obj: 2.125e+00
## It: 439; obj: 2.125e+00; abs: 6.421e-11; rel: 3.021e-11; norm: 1.054e-01; mom: 1.301e-04;
## best it: 366; best obj: 2.125e+00
## It: 440; obj: 2.125e+00; abs: 2.669e-11; rel: 1.256e-11; norm: 1.054e-01; mom: 1.757e-04;
## best it: 366; best obj: 2.125e+00
## It: 441; obj: 2.125e+00; abs: 9.309e-11; rel: 4.380e-11; norm: 1.054e-01; mom: 3.251e-05;
## best it: 366; best obj: 2.125e+00
## It: 442; obj: 2.125e+00; abs: 9.946e-11; rel: 4.680e-11; norm: 1.054e-01; mom: 1.621e-04;
## best it: 366; best obj: 2.125e+00
## It: 443; obj: 2.125e+00; abs: 2.448e-12; rel: 1.152e-12; norm: 1.054e-01; mom: 1.867e-04;
## best it: 366; best obj: 2.125e+00
## It: 444; obj: 2.125e+00; abs: 1.005e-10; rel: 4.728e-11; norm: 1.054e-01; mom: 1.861e-05;
## best it: 366; best obj: 2.125e+00
## It: 445; obj: 2.125e+00; abs: 1.410e-10; rel: 6.632e-11; norm: 1.054e-01; mom: 1.969e-04;
## best it: 366; best obj: 2.125e+00
## It: 446; obj: 2.125e+00; abs: 3.573e-11; rel: 1.681e-11; norm: 1.054e-01; mom: 1.943e-04;
## best it: 366; best obj: 2.125e+00
## It: 447; obj: 2.125e+00; abs: 9.711e-11; rel: 4.569e-11; norm: 1.054e-01; mom: 3.215e-05;
## best it: 366; best obj: 2.125e+00
## It: 448; obj: 2.125e+00; abs: 1.861e-10; rel: 8.756e-11; norm: 1.054e-01; mom: 2.342e-04;
## best it: 366; best obj: 2.125e+00
## It: 449; obj: 2.125e+00; abs: 9.002e-11; rel: 4.235e-11; norm: 1.054e-01; mom: 1.976e-04;
## best it: 366; best obj: 2.125e+00
## It: 450; obj: 2.125e+00; abs: 7.665e-11; rel: 3.607e-11; norm: 1.054e-01; mom: 6.635e-05;
## best it: 366; best obj: 2.125e+00

## It: 451; obj: 2.125e+00; abs: 2.304e-10; rel: 1.084e-10; norm: 1.054e-01; mom: 2.733e-04;
## best it: 366; best obj: 2.125e+00
## It: 452; obj: 2.125e+00; abs: 1.617e-10; rel: 7.607e-11; norm: 1.054e-01; mom: 1.953e-04;
## best it: 366; best obj: 2.125e+00
## It: 453; obj: 2.125e+00; abs: 3.249e-11; rel: 1.529e-11; norm: 1.054e-01; mom: 1.101e-04;
## best it: 366; best obj: 2.125e+00
## It: 454; obj: 2.125e+00; abs: 2.671e-10; rel: 1.257e-10; norm: 1.054e-01; mom: 3.135e-04;
## best it: 366; best obj: 2.125e+00
## It: 455; obj: 2.125e+00; abs: 2.498e-10; rel: 1.175e-10; norm: 1.054e-01; mom: 1.861e-04;
## best it: 366; best obj: 2.125e+00
## It: 456; obj: 2.125e+00; abs: 4.281e-11; rel: 2.014e-11; norm: 1.054e-01; mom: 1.622e-04;
## best it: 366; best obj: 2.125e+00
## It: 457; obj: 2.125e+00; abs: 2.868e-10; rel: 1.349e-10; norm: 1.054e-01; mom: 3.537e-04;
## best it: 366; best obj: 2.125e+00
## It: 458; obj: 2.125e+00; abs: 3.511e-10; rel: 1.652e-10; norm: 1.054e-01; mom: 1.687e-04;
## best it: 366; best obj: 2.125e+00
## It: 459; obj: 2.125e+00; abs: 1.564e-10; rel: 7.358e-11; norm: 1.054e-01; mom: 2.227e-04;
## best it: 366; best obj: 2.125e+00
## It: 460; obj: 2.125e+00; abs: 2.769e-10; rel: 1.303e-10; norm: 1.054e-01; mom: 3.925e-04;
## best it: 366; best obj: 2.125e+00
## It: 461; obj: 2.125e+00; abs: 4.574e-10; rel: 2.152e-10; norm: 1.054e-01; mom: 1.418e-04;
## best it: 366; best obj: 2.125e+00
## It: 462; obj: 2.125e+00; abs: 3.139e-10; rel: 1.477e-10; norm: 1.054e-01; mom: 2.914e-04;

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## best it: 366; best obj: 2.125e+00
## It: 463; obj: 2.125e+00; abs: 2.219e-10; rel: 1.044e-10; norm: 1.054e-01; mom: 4.286e-04;
## best it: 366; best obj: 2.125e+00
## It: 464; obj: 2.125e+00; abs: 5.562e-10; rel: 2.617e-10; norm: 1.054e-01; mom: 1.046e-04;
## best it: 366; best obj: 2.125e+00
## It: 465; obj: 2.125e+00; abs: 5.176e-10; rel: 2.435e-10; norm: 1.054e-01; mom: 3.684e-04;
## best it: 366; best obj: 2.125e+00
## It: 466; obj: 2.125e+00; abs: 1.052e-10; rel: 4.949e-11; norm: 1.054e-01; mom: 4.595e-04;
## best it: 366; best obj: 2.125e+00
## It: 467; obj: 2.125e+00; abs: 6.278e-10; rel: 2.954e-10; norm: 1.054e-01; mom: 6.114e-05;
## best it: 366; best obj: 2.125e+00
## It: 468; obj: 2.125e+00; abs: 7.652e-10; rel: 3.600e-10; norm: 1.054e-01; mom: 4.530e-04;
## best it: 366; best obj: 2.125e+00
## It: 469; obj: 2.125e+00; abs: 9.262e-11; rel: 4.358e-11; norm: 1.054e-01; mom: 4.837e-04;
## best it: 366; best obj: 2.125e+00
## It: 470; obj: 2.125e+00; abs: 6.451e-10; rel: 3.035e-10; norm: 1.054e-01; mom: 5.341e-05;
## best it: 366; best obj: 2.125e+00
## It: 471; obj: 2.125e+00; abs: 1.045e-09; rel: 4.916e-10; norm: 1.054e-01; mom: 5.444e-04;
## best it: 366; best obj: 2.125e+00
## It: 472; obj: 2.125e+00; abs: 3.859e-10; rel: 1.816e-10; norm: 1.054e-01; mom: 4.979e-04;
## best it: 366; best obj: 2.125e+00
## It: 473; obj: 2.125e+00; abs: 5.752e-10; rel: 2.706e-10; norm: 1.054e-01; mom: 1.203e-04;
## best it: 366; best obj: 2.125e+00
## It: 474; obj: 2.125e+00; abs: 1.337e-09; rel: 6.290e-10; norm: 1.054e-01; mom: 6.415e-04;
## best it: 366; best obj: 2.125e+00
## It: 475; obj: 2.125e+00; abs: 7.900e-10; rel: 3.717e-10; norm: 1.054e-01; mom: 4.998e-04;
## best it: 366; best obj: 2.125e+00

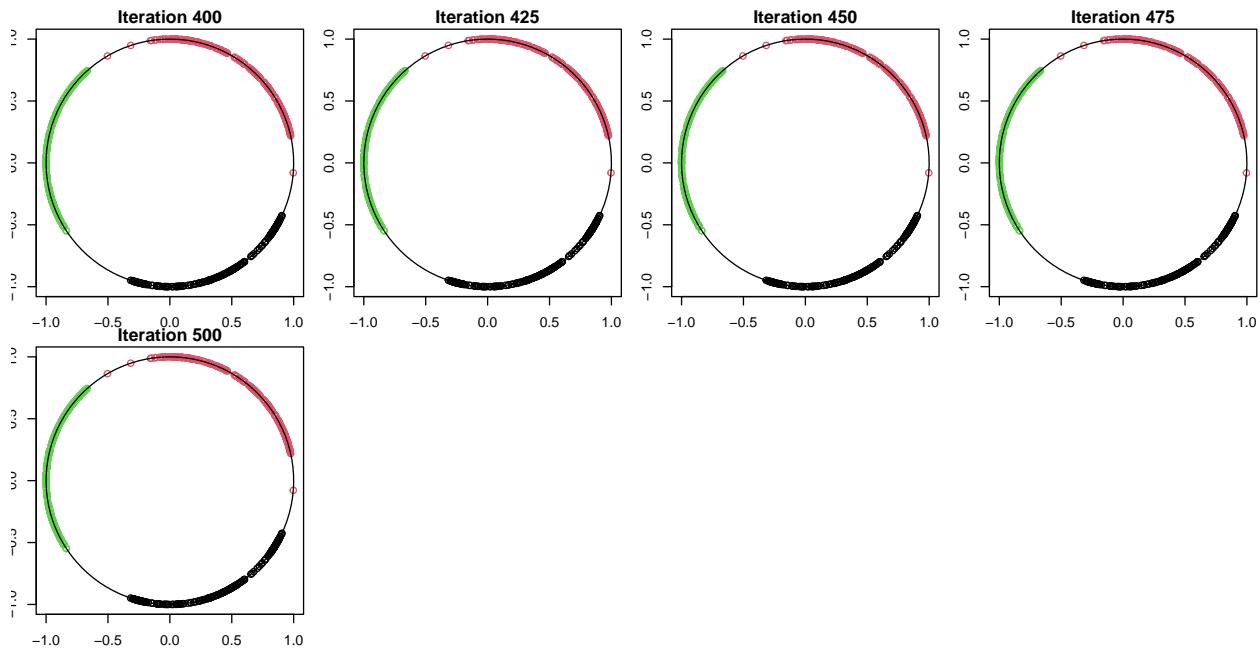
## It: 476; obj: 2.125e+00; abs: 3.744e-10; rel: 1.761e-10; norm: 1.054e-01; mom: 2.200e-04;
## best it: 366; best obj: 2.125e+00
## It: 477; obj: 2.125e+00; abs: 1.603e-09; rel: 7.543e-10; norm: 1.054e-01; mom: 7.421e-04;
## best it: 366; best obj: 2.125e+00
## It: 478; obj: 2.125e+00; abs: 1.302e-09; rel: 6.126e-10; norm: 1.054e-01; mom: 4.858e-04;
## best it: 366; best obj: 2.125e+00
## It: 479; obj: 2.125e+00; abs: 1.741e-13; rel: 8.191e-14; norm: 1.054e-01; mom: 3.409e-04;
## best it: 366; best obj: 2.125e+00
## It: 480; obj: 2.125e+00; abs: 1.795e-09; rel: 8.446e-10; norm: 1.054e-01; mom: 8.445e-04;
## best it: 366; best obj: 2.125e+00
## It: 481; obj: 2.125e+00; abs: 1.915e-09; rel: 9.011e-10; norm: 1.054e-01; mom: 4.527e-04;
## best it: 366; best obj: 2.125e+00
## It: 482; obj: 2.125e+00; abs: 5.997e-10; rel: 2.822e-10; norm: 1.054e-01; mom: 4.836e-04;
## best it: 366; best obj: 2.125e+00
## It: 483; obj: 2.125e+00; abs: 1.838e-09; rel: 8.650e-10; norm: 1.054e-01; mom: 9.448e-04;
## best it: 366; best obj: 2.125e+00
## It: 484; obj: 2.125e+00; abs: 2.587e-09; rel: 1.217e-09; norm: 1.054e-01; mom: 3.972e-04;
## best it: 366; best obj: 2.125e+00
## It: 485; obj: 2.125e+00; abs: 1.463e-09; rel: 6.883e-10; norm: 1.054e-01; mom: 6.468e-04;
## best it: 366; best obj: 2.125e+00
## It: 486; obj: 2.125e+00; abs: 1.646e-09; rel: 7.745e-10; norm: 1.054e-01; mom: 1.041e-03;
## best it: 366; best obj: 2.125e+00
## It: 487; obj: 2.125e+00; abs: 3.260e-09; rel: 1.534e-09; norm: 1.054e-01; mom: 3.159e-04;
## best it: 366; best obj: 2.125e+00
## It: 488; obj: 2.125e+00; abs: 2.618e-09; rel: 1.232e-09; norm: 1.054e-01; mom: 8.317e-04;
## best it: 366; best obj: 2.125e+00

```

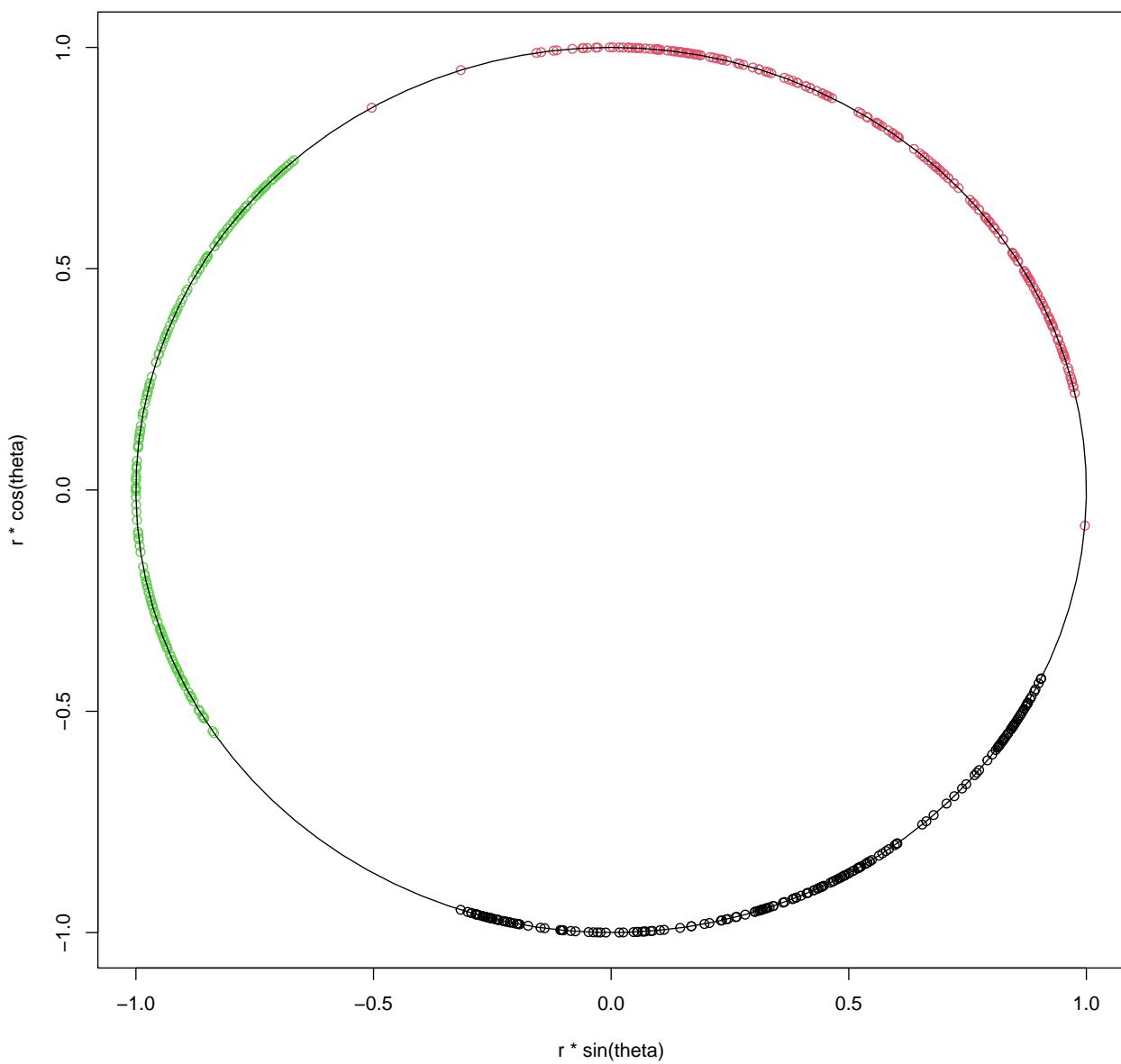
```

## It: 489; obj: 2.125e+00; abs: 1.116e-09; rel: 5.249e-10; norm: 1.054e-01; mom: 1.126e-03;
## best it: 366; best obj: 2.125e+00
## It: 490; obj: 2.125e+00; abs: 3.827e-09; rel: 1.801e-09; norm: 1.054e-01; mom: 2.110e-04;
## best it: 366; best obj: 2.125e+00
## It: 491; obj: 2.125e+00; abs: 4.071e-09; rel: 1.916e-09; norm: 1.054e-01; mom: 1.036e-03;
## best it: 366; best obj: 2.125e+00
## It: 492; obj: 2.125e+00; abs: 1.199e-10; rel: 5.641e-11; norm: 1.054e-01; mom: 1.197e-03;
## best it: 366; best obj: 2.125e+00
## It: 493; obj: 2.125e+00; abs: 4.137e-09; rel: 1.947e-09; norm: 1.054e-01; mom: 1.199e-04;
## best it: 366; best obj: 2.125e+00
## It: 494; obj: 2.125e+00; abs: 5.768e-09; rel: 2.714e-09; norm: 1.054e-01; mom: 1.259e-03;
## best it: 366; best obj: 2.125e+00
## It: 495; obj: 2.125e+00; abs: 1.429e-09; rel: 6.722e-10; norm: 1.054e-01; mom: 1.246e-03;
## best it: 366; best obj: 2.125e+00
## It: 496; obj: 2.125e+00; abs: 4.011e-09; rel: 1.887e-09; norm: 1.054e-01; mom: 2.023e-04;
## best it: 366; best obj: 2.125e+00
## It: 497; obj: 2.125e+00; abs: 7.634e-09; rel: 3.592e-09; norm: 1.054e-01; mom: 1.499e-03;
## best it: 366; best obj: 2.125e+00
## It: 498; obj: 2.125e+00; abs: 3.669e-09; rel: 1.726e-09; norm: 1.054e-01; mom: 1.269e-03;
## best it: 366; best obj: 2.125e+00
## It: 499; obj: 2.125e+00; abs: 3.174e-09; rel: 1.493e-09; norm: 1.054e-01; mom: 4.223e-04;
## best it: 366; best obj: 2.125e+00
## It: 500; obj: 2.125e+00; abs: 9.448e-09; rel: 4.445e-09; norm: 1.054e-01; mom: 1.749e-03;
## best it: 366; best obj: 2.125e+00

```



### Iteration 366



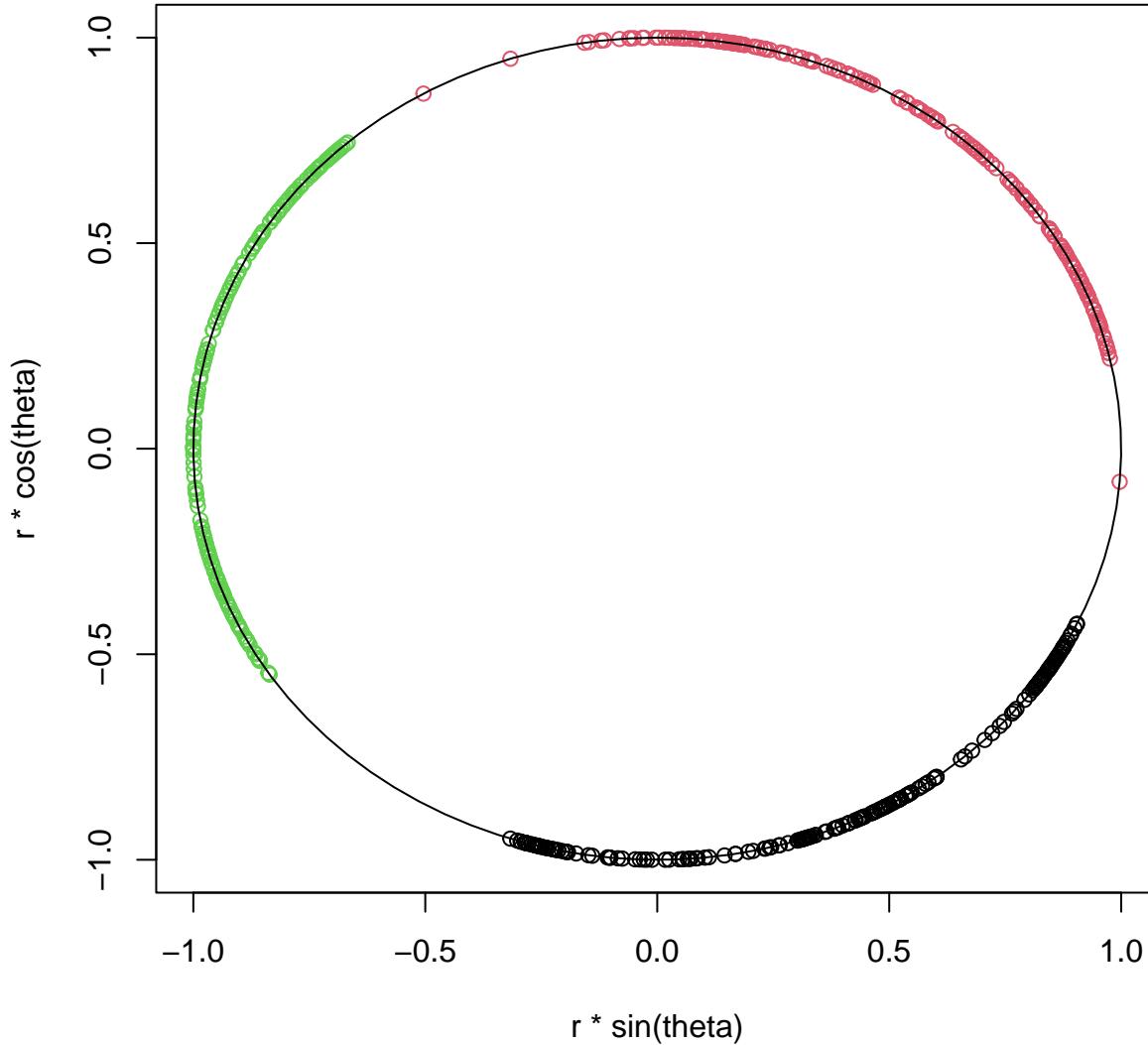
```

Y <- res_pscsne$best_Y

Y_rad <- DirStats::to_rad(Y)
r <- 1
theta <- Y_rad
plot(r*sin(theta),
     r*cos(theta),
     col=colors,
     xlim=c(-max(r),max(r)),
     ylim=c(-max(r),max(r)))

polygon(max(r)*sin(seq(0,2*pi,length.out=100)),max(r)*cos(seq(0,2*pi,length.out=100)))

```



Now we are going to reduce to dimension  $\mathbb{S}^2$  then  $d = 2$  (sphere):

```
res_pscsne <- psc_sne(X=x_3, d=2, rho_psc_list = rho_third_perp25,
                        num_iteration = 500, colors = colors, show_prog = TRUE)
```

```
## It: 1; obj: 1.855e+01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.539e-01; mom: 0.000e+00;
## best it: 1; best obj: 1.855e+01

## It: 2; obj: 1.574e+01; abs: 2.816e+00; rel: 1.518e-01; norm: 3.773e-01; mom: 9.603e+00;
## best it: 2; best obj: 1.574e+01
## It: 3; obj: 1.459e+01; abs: 1.147e+00; rel: 7.286e-02; norm: 6.602e-01; mom: 5.707e+00;
## best it: 3; best obj: 1.459e+01
## It: 4; obj: 1.402e+01; abs: 5.704e-01; rel: 3.909e-02; norm: 8.020e-01; mom: 2.975e+00;
## best it: 4; best obj: 1.402e+01
## It: 5; obj: 1.365e+01; abs: 3.729e-01; rel: 2.660e-02; norm: 8.879e-01; mom: 1.735e+00;
## best it: 5; best obj: 1.365e+01
## It: 6; obj: 1.334e+01; abs: 3.121e-01; rel: 2.287e-02; norm: 9.480e-01; mom: 1.323e+00;
## best it: 6; best obj: 1.334e+01
## It: 7; obj: 1.304e+01; abs: 2.957e-01; rel: 2.217e-02; norm: 9.932e-01; mom: 9.668e-01;
## best it: 7; best obj: 1.304e+01
## It: 8; obj: 1.278e+01; abs: 2.625e-01; rel: 2.013e-02; norm: 1.033e+00; mom: 8.692e-01;
```

```

## best it: 8; best obj: 1.278e+01
## It: 9; obj: 1.256e+01; abs: 2.181e-01; rel: 1.707e-02; norm: 1.073e+00; mom: 8.091e-01;
## best it: 9; best obj: 1.256e+01
## It: 10; obj: 1.237e+01; abs: 1.870e-01; rel: 1.489e-02; norm: 1.110e+00; mom: 7.259e-01;
## best it: 10; best obj: 1.237e+01
## It: 11; obj: 1.221e+01; abs: 1.621e-01; rel: 1.310e-02; norm: 1.144e+00; mom: 6.775e-01;
## best it: 11; best obj: 1.221e+01
## It: 12; obj: 1.208e+01; abs: 1.295e-01; rel: 1.060e-02; norm: 1.175e+00; mom: 6.819e-01;
## best it: 12; best obj: 1.208e+01
## It: 13; obj: 1.200e+01; abs: 7.713e-02; rel: 6.384e-03; norm: 1.203e+00; mom: 6.539e-01;
## best it: 13; best obj: 1.200e+01
## It: 14; obj: 1.198e+01; abs: 2.276e-02; rel: 1.896e-03; norm: 1.230e+00; mom: 5.866e-01;
## best it: 14; best obj: 1.198e+01
## It: 15; obj: 1.200e+01; abs: 1.519e-02; rel: 1.267e-03; norm: 1.257e+00; mom: 5.013e-01;
## best it: 14; best obj: 1.198e+01
## It: 16; obj: 1.203e+01; abs: 3.771e-02; rel: 3.143e-03; norm: 1.285e+00; mom: 4.304e-01;
## best it: 14; best obj: 1.198e+01
## It: 17; obj: 1.209e+01; abs: 5.158e-02; rel: 4.286e-03; norm: 1.314e+00; mom: 3.764e-01;
## best it: 14; best obj: 1.198e+01
## It: 18; obj: 1.214e+01; abs: 5.921e-02; rel: 4.899e-03; norm: 1.343e+00; mom: 3.356e-01;
## best it: 14; best obj: 1.198e+01
## It: 19; obj: 1.221e+01; abs: 6.335e-02; rel: 5.216e-03; norm: 1.370e+00; mom: 3.048e-01;
## best it: 14; best obj: 1.198e+01
## It: 20; obj: 1.227e+01; abs: 6.503e-02; rel: 5.327e-03; norm: 1.396e+00; mom: 2.812e-01;
## best it: 14; best obj: 1.198e+01
## It: 21; obj: 1.234e+01; abs: 6.537e-02; rel: 5.326e-03; norm: 1.419e+00; mom: 2.620e-01;
## best it: 14; best obj: 1.198e+01
## It: 22; obj: 1.240e+01; abs: 6.473e-02; rel: 5.246e-03; norm: 1.440e+00; mom: 2.447e-01;
## best it: 14; best obj: 1.198e+01
## It: 23; obj: 1.247e+01; abs: 6.329e-02; rel: 5.103e-03; norm: 1.458e+00; mom: 2.277e-01;
## best it: 14; best obj: 1.198e+01
## It: 24; obj: 1.253e+01; abs: 6.110e-02; rel: 4.901e-03; norm: 1.473e+00; mom: 2.102e-01;
## best it: 14; best obj: 1.198e+01
## It: 25; obj: 1.259e+01; abs: 5.823e-02; rel: 4.648e-03; norm: 1.486e+00; mom: 1.923e-01;
## best it: 14; best obj: 1.198e+01

## It: 26; obj: 1.264e+01; abs: 5.477e-02; rel: 4.352e-03; norm: 1.496e+00; mom: 1.743e-01;
## best it: 14; best obj: 1.198e+01
## It: 27; obj: 1.269e+01; abs: 5.087e-02; rel: 4.024e-03; norm: 1.504e+00; mom: 1.565e-01;
## best it: 14; best obj: 1.198e+01
## It: 28; obj: 1.274e+01; abs: 4.670e-02; rel: 3.680e-03; norm: 1.511e+00; mom: 1.393e-01;
## best it: 14; best obj: 1.198e+01
## It: 29; obj: 1.278e+01; abs: 4.244e-02; rel: 3.332e-03; norm: 1.516e+00; mom: 1.232e-01;
## best it: 14; best obj: 1.198e+01
## It: 30; obj: 1.282e+01; abs: 3.824e-02; rel: 2.992e-03; norm: 1.520e+00; mom: 1.083e-01;
## best it: 14; best obj: 1.198e+01
## It: 31; obj: 1.285e+01; abs: 3.423e-02; rel: 2.670e-03; norm: 1.523e+00; mom: 9.492e-02;
## best it: 14; best obj: 1.198e+01
## It: 32; obj: 1.288e+01; abs: 3.048e-02; rel: 2.372e-03; norm: 1.526e+00; mom: 8.305e-02;
## best it: 14; best obj: 1.198e+01
## It: 33; obj: 1.291e+01; abs: 2.705e-02; rel: 2.099e-03; norm: 1.528e+00; mom: 7.268e-02;
## best it: 14; best obj: 1.198e+01
## It: 34; obj: 1.293e+01; abs: 2.394e-02; rel: 1.854e-03; norm: 1.530e+00; mom: 6.370e-02;
## best it: 14; best obj: 1.198e+01

```

```

## It: 35; obj: 1.296e+01; abs: 2.116e-02; rel: 1.636e-03; norm: 1.531e+00; mom: 5.597e-02;
## best it: 14; best obj: 1.198e+01
## It: 36; obj: 1.297e+01; abs: 1.868e-02; rel: 1.442e-03; norm: 1.532e+00; mom: 4.937e-02;
## best it: 14; best obj: 1.198e+01
## It: 37; obj: 1.299e+01; abs: 1.649e-02; rel: 1.271e-03; norm: 1.533e+00; mom: 4.372e-02;
## best it: 14; best obj: 1.198e+01
## It: 38; obj: 1.301e+01; abs: 1.455e-02; rel: 1.120e-03; norm: 1.534e+00; mom: 3.891e-02;
## best it: 14; best obj: 1.198e+01
## It: 39; obj: 1.302e+01; abs: 1.284e-02; rel: 9.874e-04; norm: 1.534e+00; mom: 3.482e-02;
## best it: 14; best obj: 1.198e+01
## It: 40; obj: 1.303e+01; abs: 1.133e-02; rel: 8.707e-04; norm: 1.535e+00; mom: 3.133e-02;
## best it: 14; best obj: 1.198e+01
## It: 41; obj: 1.304e+01; abs: 1.001e-02; rel: 7.680e-04; norm: 1.536e+00; mom: 2.836e-02;
## best it: 14; best obj: 1.198e+01
## It: 42; obj: 1.305e+01; abs: 8.835e-03; rel: 6.776e-04; norm: 1.536e+00; mom: 2.583e-02;
## best it: 14; best obj: 1.198e+01
## It: 43; obj: 1.306e+01; abs: 7.802e-03; rel: 5.980e-04; norm: 1.536e+00; mom: 2.369e-02;
## best it: 14; best obj: 1.198e+01
## It: 44; obj: 1.306e+01; abs: 6.891e-03; rel: 5.278e-04; norm: 1.537e+00; mom: 2.189e-02;
## best it: 14; best obj: 1.198e+01
## It: 45; obj: 1.307e+01; abs: 6.085e-03; rel: 4.658e-04; norm: 1.537e+00; mom: 2.037e-02;
## best it: 14; best obj: 1.198e+01
## It: 46; obj: 1.307e+01; abs: 5.373e-03; rel: 4.111e-04; norm: 1.537e+00; mom: 1.910e-02;
## best it: 14; best obj: 1.198e+01
## It: 47; obj: 1.308e+01; abs: 4.743e-03; rel: 3.627e-04; norm: 1.538e+00; mom: 1.803e-02;
## best it: 14; best obj: 1.198e+01
## It: 48; obj: 1.308e+01; abs: 4.184e-03; rel: 3.199e-04; norm: 1.538e+00; mom: 1.713e-02;
## best it: 14; best obj: 1.198e+01
## It: 49; obj: 1.309e+01; abs: 3.689e-03; rel: 2.820e-04; norm: 1.538e+00; mom: 1.637e-02;
## best it: 14; best obj: 1.198e+01
## It: 50; obj: 1.309e+01; abs: 3.250e-03; rel: 2.484e-04; norm: 1.538e+00; mom: 1.572e-02;
## best it: 14; best obj: 1.198e+01

## It: 51; obj: 1.309e+01; abs: 2.861e-03; rel: 2.185e-04; norm: 1.538e+00; mom: 1.515e-02;
## best it: 14; best obj: 1.198e+01
## It: 52; obj: 1.310e+01; abs: 2.514e-03; rel: 1.920e-04; norm: 1.539e+00; mom: 1.465e-02;
## best it: 14; best obj: 1.198e+01
## It: 53; obj: 1.310e+01; abs: 2.207e-03; rel: 1.685e-04; norm: 1.539e+00; mom: 1.422e-02;
## best it: 14; best obj: 1.198e+01
## It: 54; obj: 1.310e+01; abs: 1.933e-03; rel: 1.476e-04; norm: 1.539e+00; mom: 1.384e-02;
## best it: 14; best obj: 1.198e+01
## It: 55; obj: 1.310e+01; abs: 1.689e-03; rel: 1.289e-04; norm: 1.539e+00; mom: 1.350e-02;
## best it: 14; best obj: 1.198e+01
## It: 56; obj: 1.310e+01; abs: 1.472e-03; rel: 1.123e-04; norm: 1.539e+00; mom: 1.322e-02;
## best it: 14; best obj: 1.198e+01
## It: 57; obj: 1.310e+01; abs: 1.278e-03; rel: 9.755e-05; norm: 1.540e+00; mom: 1.298e-02;
## best it: 14; best obj: 1.198e+01
## It: 58; obj: 1.311e+01; abs: 1.106e-03; rel: 8.437e-05; norm: 1.540e+00; mom: 1.278e-02;
## best it: 14; best obj: 1.198e+01
## It: 59; obj: 1.311e+01; abs: 9.517e-04; rel: 7.262e-05; norm: 1.540e+00; mom: 1.261e-02;
## best it: 14; best obj: 1.198e+01
## It: 60; obj: 1.311e+01; abs: 8.143e-04; rel: 6.213e-05; norm: 1.540e+00; mom: 1.246e-02;
## best it: 14; best obj: 1.198e+01
## It: 61; obj: 1.311e+01; abs: 6.916e-04; rel: 5.276e-05; norm: 1.541e+00; mom: 1.233e-02;

```

```

## best it: 14; best obj: 1.198e+01
## It: 62; obj: 1.311e+01; abs: 5.820e-04; rel: 4.440e-05; norm: 1.541e+00; mom: 1.220e-02;
## best it: 14; best obj: 1.198e+01
## It: 63; obj: 1.311e+01; abs: 4.840e-04; rel: 3.692e-05; norm: 1.541e+00; mom: 1.209e-02;
## best it: 14; best obj: 1.198e+01
## It: 64; obj: 1.311e+01; abs: 3.964e-04; rel: 3.024e-05; norm: 1.541e+00; mom: 1.198e-02;
## best it: 14; best obj: 1.198e+01
## It: 65; obj: 1.311e+01; abs: 3.181e-04; rel: 2.426e-05; norm: 1.541e+00; mom: 1.187e-02;
## best it: 14; best obj: 1.198e+01
## It: 66; obj: 1.311e+01; abs: 2.480e-04; rel: 1.892e-05; norm: 1.542e+00; mom: 1.177e-02;
## best it: 14; best obj: 1.198e+01
## It: 67; obj: 1.311e+01; abs: 1.853e-04; rel: 1.413e-05; norm: 1.542e+00; mom: 1.167e-02;
## best it: 14; best obj: 1.198e+01
## It: 68; obj: 1.311e+01; abs: 1.291e-04; rel: 9.849e-06; norm: 1.542e+00; mom: 1.158e-02;
## best it: 14; best obj: 1.198e+01
## It: 69; obj: 1.311e+01; abs: 7.888e-05; rel: 6.017e-06; norm: 1.542e+00; mom: 1.149e-02;
## best it: 14; best obj: 1.198e+01
## It: 70; obj: 1.311e+01; abs: 3.390e-05; rel: 2.586e-06; norm: 1.543e+00; mom: 1.140e-02;
## best it: 14; best obj: 1.198e+01
## It: 71; obj: 1.311e+01; abs: 6.359e-06; rel: 4.850e-07; norm: 1.543e+00; mom: 1.131e-02;
## best it: 14; best obj: 1.198e+01
## It: 72; obj: 1.311e+01; abs: 4.239e-05; rel: 3.233e-06; norm: 1.543e+00; mom: 1.123e-02;
## best it: 14; best obj: 1.198e+01
## It: 73; obj: 1.311e+01; abs: 7.463e-05; rel: 5.693e-06; norm: 1.544e+00; mom: 1.114e-02;
## best it: 14; best obj: 1.198e+01
## It: 74; obj: 1.311e+01; abs: 1.035e-04; rel: 7.892e-06; norm: 1.544e+00; mom: 1.106e-02;
## best it: 14; best obj: 1.198e+01
## It: 75; obj: 1.311e+01; abs: 1.292e-04; rel: 9.857e-06; norm: 1.544e+00; mom: 1.098e-02;
## best it: 14; best obj: 1.198e+01

## It: 76; obj: 1.311e+01; abs: 1.522e-04; rel: 1.161e-05; norm: 1.544e+00; mom: 1.090e-02;
## best it: 14; best obj: 1.198e+01
## It: 77; obj: 1.311e+01; abs: 1.727e-04; rel: 1.318e-05; norm: 1.545e+00; mom: 1.082e-02;
## best it: 14; best obj: 1.198e+01
## It: 78; obj: 1.311e+01; abs: 1.910e-04; rel: 1.457e-05; norm: 1.545e+00; mom: 1.074e-02;
## best it: 14; best obj: 1.198e+01
## It: 79; obj: 1.311e+01; abs: 2.072e-04; rel: 1.580e-05; norm: 1.545e+00; mom: 1.066e-02;
## best it: 14; best obj: 1.198e+01
## It: 80; obj: 1.311e+01; abs: 2.215e-04; rel: 1.690e-05; norm: 1.546e+00; mom: 1.059e-02;
## best it: 14; best obj: 1.198e+01
## It: 81; obj: 1.311e+01; abs: 2.342e-04; rel: 1.787e-05; norm: 1.546e+00; mom: 1.051e-02;
## best it: 14; best obj: 1.198e+01
## It: 82; obj: 1.311e+01; abs: 2.453e-04; rel: 1.872e-05; norm: 1.546e+00; mom: 1.044e-02;
## best it: 14; best obj: 1.198e+01
## It: 83; obj: 1.311e+01; abs: 2.551e-04; rel: 1.946e-05; norm: 1.547e+00; mom: 1.036e-02;
## best it: 14; best obj: 1.198e+01
## It: 84; obj: 1.311e+01; abs: 2.635e-04; rel: 2.010e-05; norm: 1.547e+00; mom: 1.029e-02;
## best it: 14; best obj: 1.198e+01
## It: 85; obj: 1.311e+01; abs: 2.707e-04; rel: 2.065e-05; norm: 1.547e+00; mom: 1.022e-02;
## best it: 14; best obj: 1.198e+01
## It: 86; obj: 1.311e+01; abs: 2.768e-04; rel: 2.112e-05; norm: 1.548e+00; mom: 1.015e-02;
## best it: 14; best obj: 1.198e+01
## It: 87; obj: 1.311e+01; abs: 2.819e-04; rel: 2.151e-05; norm: 1.548e+00; mom: 1.007e-02;
## best it: 14; best obj: 1.198e+01

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## It: 88; obj: 1.311e+01; abs: 2.861e-04; rel: 2.183e-05; norm: 1.548e+00; mom: 1.000e-02;
## best it: 14; best obj: 1.198e+01
## It: 89; obj: 1.311e+01; abs: 2.894e-04; rel: 2.208e-05; norm: 1.549e+00; mom: 9.934e-03;
## best it: 14; best obj: 1.198e+01
## It: 90; obj: 1.311e+01; abs: 2.918e-04; rel: 2.227e-05; norm: 1.549e+00; mom: 9.864e-03;
## best it: 14; best obj: 1.198e+01
## It: 91; obj: 1.311e+01; abs: 2.935e-04; rel: 2.239e-05; norm: 1.550e+00; mom: 9.795e-03;
## best it: 14; best obj: 1.198e+01
## It: 92; obj: 1.311e+01; abs: 2.945e-04; rel: 2.247e-05; norm: 1.550e+00; mom: 9.726e-03;
## best it: 14; best obj: 1.198e+01
## It: 93; obj: 1.311e+01; abs: 2.947e-04; rel: 2.249e-05; norm: 1.550e+00; mom: 9.657e-03;
## best it: 14; best obj: 1.198e+01
## It: 94; obj: 1.311e+01; abs: 2.943e-04; rel: 2.246e-05; norm: 1.551e+00; mom: 9.588e-03;
## best it: 14; best obj: 1.198e+01
## It: 95; obj: 1.311e+01; abs: 2.933e-04; rel: 2.238e-05; norm: 1.551e+00; mom: 9.519e-03;
## best it: 14; best obj: 1.198e+01
## It: 96; obj: 1.310e+01; abs: 2.917e-04; rel: 2.226e-05; norm: 1.551e+00; mom: 9.451e-03;
## best it: 14; best obj: 1.198e+01
## It: 97; obj: 1.310e+01; abs: 2.896e-04; rel: 2.210e-05; norm: 1.552e+00; mom: 9.382e-03;
## best it: 14; best obj: 1.198e+01
## It: 98; obj: 1.310e+01; abs: 2.870e-04; rel: 2.190e-05; norm: 1.552e+00; mom: 9.314e-03;
## best it: 14; best obj: 1.198e+01
## It: 99; obj: 1.310e+01; abs: 2.838e-04; rel: 2.166e-05; norm: 1.553e+00; mom: 9.245e-03;
## best it: 14; best obj: 1.198e+01
## It: 100; obj: 1.310e+01; abs: 2.802e-04; rel: 2.138e-05; norm: 1.553e+00; mom: 9.177e-03;
## best it: 14; best obj: 1.198e+01

## It: 101; obj: 1.801e+00; abs: 1.130e+01; rel: 8.625e-01; norm: 1.083e-01; mom: 9.108e-03;
## best it: 101; best obj: 1.801e+00
## It: 102; obj: 1.649e+00; abs: 1.523e-01; rel: 8.456e-02; norm: 1.255e-01; mom: 4.329e+00;
## best it: 102; best obj: 1.649e+00
## It: 103; obj: 1.568e+00; abs: 8.143e-02; rel: 4.938e-02; norm: 1.424e-01; mom: 4.478e+00;
## best it: 103; best obj: 1.568e+00
## It: 104; obj: 1.548e+00; abs: 2.000e-02; rel: 1.276e-02; norm: 1.413e-01; mom: 4.099e+00;
## best it: 104; best obj: 1.548e+00
## It: 105; obj: 1.536e+00; abs: 1.198e-02; rel: 7.738e-03; norm: 1.387e-01; mom: 3.466e+00;
## best it: 105; best obj: 1.536e+00
## It: 106; obj: 1.555e+00; abs: 1.959e-02; rel: 1.275e-02; norm: 1.381e-01; mom: 2.974e+00;
## best it: 105; best obj: 1.536e+00
## It: 107; obj: 1.563e+00; abs: 7.925e-03; rel: 5.095e-03; norm: 1.409e-01; mom: 3.418e+00;
## best it: 105; best obj: 1.536e+00
## It: 108; obj: 1.549e+00; abs: 1.414e-02; rel: 9.047e-03; norm: 1.389e-01; mom: 3.652e+00;
## best it: 105; best obj: 1.536e+00
## It: 109; obj: 1.527e+00; abs: 2.203e-02; rel: 1.422e-02; norm: 1.383e-01; mom: 3.319e+00;
## best it: 109; best obj: 1.527e+00
## It: 110; obj: 1.519e+00; abs: 8.343e-03; rel: 5.463e-03; norm: 1.397e-01; mom: 3.237e+00;
## best it: 110; best obj: 1.519e+00
## It: 111; obj: 1.527e+00; abs: 7.784e-03; rel: 5.125e-03; norm: 1.390e-01; mom: 3.211e+00;
## best it: 110; best obj: 1.519e+00
## It: 112; obj: 1.525e+00; abs: 1.072e-03; rel: 7.024e-04; norm: 1.383e-01; mom: 2.997e+00;
## best it: 110; best obj: 1.519e+00
## It: 113; obj: 1.530e+00; abs: 4.437e-03; rel: 2.908e-03; norm: 1.403e-01; mom: 3.102e+00;
## best it: 110; best obj: 1.519e+00
## It: 114; obj: 1.560e+00; abs: 2.964e-02; rel: 1.937e-02; norm: 1.419e-01; mom: 3.369e+00;

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## best it: 110; best obj: 1.519e+00
## It: 115; obj: 1.551e+00; abs: 8.162e-03; rel: 5.234e-03; norm: 1.408e-01; mom: 3.567e+00;
## best it: 110; best obj: 1.519e+00
## It: 116; obj: 1.554e+00; abs: 2.533e-03; rel: 1.633e-03; norm: 1.390e-01; mom: 3.616e+00;
## best it: 110; best obj: 1.519e+00
## It: 117; obj: 1.560e+00; abs: 6.163e-03; rel: 3.966e-03; norm: 1.406e-01; mom: 3.282e+00;
## best it: 110; best obj: 1.519e+00
## It: 118; obj: 1.537e+00; abs: 2.345e-02; rel: 1.503e-02; norm: 1.397e-01; mom: 3.746e+00;
## best it: 110; best obj: 1.519e+00
## It: 119; obj: 1.527e+00; abs: 9.924e-03; rel: 6.458e-03; norm: 1.401e-01; mom: 3.272e+00;
## best it: 110; best obj: 1.519e+00
## It: 120; obj: 1.554e+00; abs: 2.689e-02; rel: 1.761e-02; norm: 1.407e-01; mom: 3.097e+00;
## best it: 110; best obj: 1.519e+00
## It: 121; obj: 1.552e+00; abs: 1.811e-03; rel: 1.166e-03; norm: 1.411e-01; mom: 3.332e+00;
## best it: 110; best obj: 1.519e+00
## It: 122; obj: 1.522e+00; abs: 2.955e-02; rel: 1.904e-02; norm: 1.406e-01; mom: 3.597e+00;
## best it: 110; best obj: 1.519e+00
## It: 123; obj: 1.516e+00; abs: 6.256e-03; rel: 4.110e-03; norm: 1.419e-01; mom: 3.080e+00;
## best it: 123; best obj: 1.516e+00
## It: 124; obj: 1.510e+00; abs: 5.863e-03; rel: 3.868e-03; norm: 1.396e-01; mom: 3.456e+00;
## best it: 124; best obj: 1.510e+00
## It: 125; obj: 1.516e+00; abs: 6.120e-03; rel: 4.053e-03; norm: 1.411e-01; mom: 2.982e+00;
## best it: 124; best obj: 1.510e+00

## It: 126; obj: 1.535e+00; abs: 1.873e-02; rel: 1.235e-02; norm: 1.413e-01; mom: 2.908e+00;
## best it: 124; best obj: 1.510e+00
## It: 127; obj: 1.518e+00; abs: 1.649e-02; rel: 1.074e-02; norm: 1.421e-01; mom: 3.388e+00;
## best it: 124; best obj: 1.510e+00
## It: 128; obj: 1.506e+00; abs: 1.202e-02; rel: 7.914e-03; norm: 1.406e-01; mom: 3.024e+00;
## best it: 128; best obj: 1.506e+00
## It: 129; obj: 1.511e+00; abs: 4.405e-03; rel: 2.924e-03; norm: 1.406e-01; mom: 2.851e+00;
## best it: 128; best obj: 1.506e+00
## It: 130; obj: 1.520e+00; abs: 8.843e-03; rel: 5.853e-03; norm: 1.401e-01; mom: 3.151e+00;
## best it: 128; best obj: 1.506e+00
## It: 131; obj: 1.513e+00; abs: 6.592e-03; rel: 4.338e-03; norm: 1.410e-01; mom: 3.161e+00;
## best it: 128; best obj: 1.506e+00
## It: 132; obj: 1.514e+00; abs: 7.830e-04; rel: 5.175e-04; norm: 1.409e-01; mom: 2.966e+00;
## best it: 128; best obj: 1.506e+00
## It: 133; obj: 1.507e+00; abs: 6.814e-03; rel: 4.501e-03; norm: 1.413e-01; mom: 3.376e+00;
## best it: 128; best obj: 1.506e+00
## It: 134; obj: 1.509e+00; abs: 1.955e-03; rel: 1.297e-03; norm: 1.409e-01; mom: 2.864e+00;
## best it: 128; best obj: 1.506e+00
## It: 135; obj: 1.533e+00; abs: 2.435e-02; rel: 1.614e-02; norm: 1.416e-01; mom: 2.843e+00;
## best it: 128; best obj: 1.506e+00
## It: 136; obj: 1.527e+00; abs: 6.667e-03; rel: 4.348e-03; norm: 1.413e-01; mom: 3.408e+00;
## best it: 128; best obj: 1.506e+00
## It: 137; obj: 1.509e+00; abs: 1.753e-02; rel: 1.148e-02; norm: 1.418e-01; mom: 3.431e+00;
## best it: 128; best obj: 1.506e+00
## It: 138; obj: 1.528e+00; abs: 1.864e-02; rel: 1.235e-02; norm: 1.406e-01; mom: 2.859e+00;
## best it: 128; best obj: 1.506e+00
## It: 139; obj: 1.516e+00; abs: 1.205e-02; rel: 7.887e-03; norm: 1.416e-01; mom: 3.192e+00;
## best it: 128; best obj: 1.506e+00
## It: 140; obj: 1.491e+00; abs: 2.471e-02; rel: 1.630e-02; norm: 1.410e-01; mom: 3.309e+00;
## best it: 140; best obj: 1.491e+00

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## It: 141; obj: 1.512e+00; abs: 2.128e-02; rel: 1.427e-02; norm: 1.407e-01; mom: 2.750e+00;
## best it: 140; best obj: 1.491e+00
## It: 142; obj: 1.515e+00; abs: 2.659e-03; rel: 1.758e-03; norm: 1.409e-01; mom: 2.972e+00;
## best it: 140; best obj: 1.491e+00
## It: 143; obj: 1.491e+00; abs: 2.376e-02; rel: 1.568e-02; norm: 1.406e-01; mom: 3.110e+00;
## best it: 140; best obj: 1.491e+00
## It: 144; obj: 1.509e+00; abs: 1.747e-02; rel: 1.171e-02; norm: 1.403e-01; mom: 2.817e+00;
## best it: 140; best obj: 1.491e+00
## It: 145; obj: 1.520e+00; abs: 1.096e-02; rel: 7.263e-03; norm: 1.425e-01; mom: 3.021e+00;
## best it: 140; best obj: 1.491e+00
## It: 146; obj: 1.519e+00; abs: 1.084e-03; rel: 7.132e-04; norm: 1.405e-01; mom: 2.950e+00;
## best it: 140; best obj: 1.491e+00
## It: 147; obj: 1.525e+00; abs: 6.151e-03; rel: 4.050e-03; norm: 1.422e-01; mom: 2.891e+00;
## best it: 140; best obj: 1.491e+00
## It: 148; obj: 1.512e+00; abs: 1.319e-02; rel: 8.652e-03; norm: 1.423e-01; mom: 3.441e+00;
## best it: 140; best obj: 1.491e+00
## It: 149; obj: 1.513e+00; abs: 1.571e-03; rel: 1.040e-03; norm: 1.412e-01; mom: 3.202e+00;
## best it: 140; best obj: 1.491e+00
## It: 150; obj: 1.534e+00; abs: 2.107e-02; rel: 1.393e-02; norm: 1.426e-01; mom: 2.980e+00;
## best it: 140; best obj: 1.491e+00

## It: 151; obj: 1.533e+00; abs: 1.653e-03; rel: 1.077e-03; norm: 1.426e-01; mom: 3.278e+00;
## best it: 140; best obj: 1.491e+00
## It: 152; obj: 1.521e+00; abs: 1.107e-02; rel: 7.225e-03; norm: 1.406e-01; mom: 3.236e+00;
## best it: 140; best obj: 1.491e+00
## It: 153; obj: 1.522e+00; abs: 8.830e-04; rel: 5.803e-04; norm: 1.418e-01; mom: 3.093e+00;
## best it: 140; best obj: 1.491e+00
## It: 154; obj: 1.531e+00; abs: 8.342e-03; rel: 5.479e-03; norm: 1.402e-01; mom: 3.466e+00;
## best it: 140; best obj: 1.491e+00
## It: 155; obj: 1.528e+00; abs: 2.910e-03; rel: 1.901e-03; norm: 1.411e-01; mom: 3.113e+00;
## best it: 140; best obj: 1.491e+00
## It: 156; obj: 1.516e+00; abs: 1.136e-02; rel: 7.434e-03; norm: 1.396e-01; mom: 3.284e+00;
## best it: 140; best obj: 1.491e+00
## It: 157; obj: 1.515e+00; abs: 1.364e-03; rel: 8.998e-04; norm: 1.387e-01; mom: 3.116e+00;
## best it: 140; best obj: 1.491e+00
## It: 158; obj: 1.516e+00; abs: 4.802e-04; rel: 3.169e-04; norm: 1.393e-01; mom: 2.993e+00;
## best it: 140; best obj: 1.491e+00
## It: 159; obj: 1.531e+00; abs: 1.582e-02; rel: 1.044e-02; norm: 1.422e-01; mom: 2.977e+00;
## best it: 140; best obj: 1.491e+00
## It: 160; obj: 1.537e+00; abs: 5.365e-03; rel: 3.504e-03; norm: 1.413e-01; mom: 3.352e+00;
## best it: 140; best obj: 1.491e+00
## It: 161; obj: 1.519e+00; abs: 1.758e-02; rel: 1.144e-02; norm: 1.400e-01; mom: 3.388e+00;
## best it: 140; best obj: 1.491e+00
## It: 162; obj: 1.529e+00; abs: 9.517e-03; rel: 6.265e-03; norm: 1.409e-01; mom: 3.098e+00;
## best it: 140; best obj: 1.491e+00
## It: 163; obj: 1.544e+00; abs: 1.554e-02; rel: 1.017e-02; norm: 1.416e-01; mom: 3.423e+00;
## best it: 140; best obj: 1.491e+00
## It: 164; obj: 1.527e+00; abs: 1.673e-02; rel: 1.083e-02; norm: 1.419e-01; mom: 3.405e+00;
## best it: 140; best obj: 1.491e+00
## It: 165; obj: 1.522e+00; abs: 5.724e-03; rel: 3.748e-03; norm: 1.414e-01; mom: 3.318e+00;
## best it: 140; best obj: 1.491e+00
## It: 166; obj: 1.514e+00; abs: 8.052e-03; rel: 5.292e-03; norm: 1.408e-01; mom: 3.074e+00;
## best it: 140; best obj: 1.491e+00
## It: 167; obj: 1.516e+00; abs: 1.955e-03; rel: 1.291e-03; norm: 1.397e-01; mom: 2.952e+00;

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## best it: 140; best obj: 1.491e+00
## It: 168; obj: 1.522e+00; abs: 6.679e-03; rel: 4.406e-03; norm: 1.408e-01; mom: 2.842e+00;
## best it: 140; best obj: 1.491e+00
## It: 169; obj: 1.507e+00; abs: 1.578e-02; rel: 1.036e-02; norm: 1.409e-01; mom: 2.996e+00;
## best it: 140; best obj: 1.491e+00
## It: 170; obj: 1.518e+00; abs: 1.194e-02; rel: 7.927e-03; norm: 1.401e-01; mom: 3.148e+00;
## best it: 140; best obj: 1.491e+00
## It: 171; obj: 1.532e+00; abs: 1.372e-02; rel: 9.034e-03; norm: 1.411e-01; mom: 3.115e+00;
## best it: 140; best obj: 1.491e+00
## It: 172; obj: 1.531e+00; abs: 9.769e-04; rel: 6.376e-04; norm: 1.412e-01; mom: 3.419e+00;
## best it: 140; best obj: 1.491e+00
## It: 173; obj: 1.533e+00; abs: 1.382e-03; rel: 9.023e-04; norm: 1.405e-01; mom: 3.258e+00;
## best it: 140; best obj: 1.491e+00
## It: 174; obj: 1.538e+00; abs: 5.336e-03; rel: 3.481e-03; norm: 1.420e-01; mom: 3.109e+00;
## best it: 140; best obj: 1.491e+00
## It: 175; obj: 1.537e+00; abs: 1.294e-03; rel: 8.412e-04; norm: 1.425e-01; mom: 3.486e+00;
## best it: 140; best obj: 1.491e+00

## It: 176; obj: 1.533e+00; abs: 3.193e-03; rel: 2.078e-03; norm: 1.397e-01; mom: 3.307e+00;
## best it: 140; best obj: 1.491e+00
## It: 177; obj: 1.531e+00; abs: 1.973e-03; rel: 1.287e-03; norm: 1.406e-01; mom: 3.179e+00;
## best it: 140; best obj: 1.491e+00
## It: 178; obj: 1.527e+00; abs: 4.798e-03; rel: 3.133e-03; norm: 1.419e-01; mom: 3.432e+00;
## best it: 140; best obj: 1.491e+00
## It: 179; obj: 1.504e+00; abs: 2.230e-02; rel: 1.461e-02; norm: 1.398e-01; mom: 3.255e+00;
## best it: 140; best obj: 1.491e+00
## It: 180; obj: 1.512e+00; abs: 7.673e-03; rel: 5.100e-03; norm: 1.398e-01; mom: 2.734e+00;
## best it: 140; best obj: 1.491e+00
## It: 181; obj: 1.530e+00; abs: 1.811e-02; rel: 1.198e-02; norm: 1.420e-01; mom: 3.048e+00;
## best it: 140; best obj: 1.491e+00
## It: 182; obj: 1.521e+00; abs: 8.691e-03; rel: 5.680e-03; norm: 1.413e-01; mom: 3.299e+00;
## best it: 140; best obj: 1.491e+00
## It: 183; obj: 1.523e+00; abs: 1.829e-03; rel: 1.202e-03; norm: 1.417e-01; mom: 2.941e+00;
## best it: 140; best obj: 1.491e+00
## It: 184; obj: 1.537e+00; abs: 1.323e-02; rel: 8.687e-03; norm: 1.421e-01; mom: 3.103e+00;
## best it: 140; best obj: 1.491e+00
## It: 185; obj: 1.528e+00; abs: 8.059e-03; rel: 5.245e-03; norm: 1.415e-01; mom: 3.260e+00;
## best it: 140; best obj: 1.491e+00
## It: 186; obj: 1.528e+00; abs: 8.362e-04; rel: 5.471e-04; norm: 1.403e-01; mom: 3.269e+00;
## best it: 140; best obj: 1.491e+00
## It: 187; obj: 1.518e+00; abs: 9.550e-03; rel: 6.252e-03; norm: 1.404e-01; mom: 3.252e+00;
## best it: 140; best obj: 1.491e+00
## It: 188; obj: 1.513e+00; abs: 4.751e-03; rel: 3.130e-03; norm: 1.396e-01; mom: 3.108e+00;
## best it: 140; best obj: 1.491e+00
## It: 189; obj: 1.523e+00; abs: 1.014e-02; rel: 6.702e-03; norm: 1.400e-01; mom: 3.000e+00;
## best it: 140; best obj: 1.491e+00
## It: 190; obj: 1.535e+00; abs: 1.118e-02; rel: 7.338e-03; norm: 1.411e-01; mom: 3.125e+00;
## best it: 140; best obj: 1.491e+00
## It: 191; obj: 1.535e+00; abs: 4.370e-04; rel: 2.847e-04; norm: 1.407e-01; mom: 3.175e+00;
## best it: 140; best obj: 1.491e+00
## It: 192; obj: 1.533e+00; abs: 2.322e-03; rel: 1.513e-03; norm: 1.399e-01; mom: 3.248e+00;
## best it: 140; best obj: 1.491e+00
## It: 193; obj: 1.538e+00; abs: 5.087e-03; rel: 3.319e-03; norm: 1.406e-01; mom: 3.226e+00;
## best it: 140; best obj: 1.491e+00

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## It: 194; obj: 1.531e+00; abs: 6.876e-03; rel: 4.471e-03; norm: 1.403e-01; mom: 3.536e+00;
## best it: 140; best obj: 1.491e+00
## It: 195; obj: 1.535e+00; abs: 4.446e-03; rel: 2.904e-03; norm: 1.413e-01; mom: 3.151e+00;
## best it: 140; best obj: 1.491e+00
## It: 196; obj: 1.521e+00; abs: 1.478e-02; rel: 9.627e-03; norm: 1.409e-01; mom: 3.321e+00;
## best it: 140; best obj: 1.491e+00
## It: 197; obj: 1.514e+00; abs: 6.299e-03; rel: 4.142e-03; norm: 1.390e-01; mom: 3.188e+00;
## best it: 140; best obj: 1.491e+00
## It: 198; obj: 1.523e+00; abs: 9.005e-03; rel: 5.946e-03; norm: 1.401e-01; mom: 2.887e+00;
## best it: 140; best obj: 1.491e+00
## It: 199; obj: 1.542e+00; abs: 1.854e-02; rel: 1.217e-02; norm: 1.409e-01; mom: 3.291e+00;
## best it: 140; best obj: 1.491e+00
## It: 200; obj: 1.532e+00; abs: 1.002e-02; rel: 6.495e-03; norm: 1.394e-01; mom: 3.427e+00;
## best it: 140; best obj: 1.491e+00

## It: 201; obj: 1.534e+00; abs: 1.620e-03; rel: 1.057e-03; norm: 1.403e-01; mom: 3.245e+00;
## best it: 140; best obj: 1.491e+00
## It: 202; obj: 1.520e+00; abs: 1.338e-02; rel: 8.726e-03; norm: 1.417e-01; mom: 3.518e+00;
## best it: 140; best obj: 1.491e+00
## It: 203; obj: 1.502e+00; abs: 1.773e-02; rel: 1.166e-02; norm: 1.403e-01; mom: 3.393e+00;
## best it: 140; best obj: 1.491e+00
## It: 204; obj: 1.496e+00; abs: 5.953e-03; rel: 3.962e-03; norm: 1.391e-01; mom: 2.768e+00;
## best it: 140; best obj: 1.491e+00
## It: 205; obj: 1.512e+00; abs: 1.532e-02; rel: 1.024e-02; norm: 1.399e-01; mom: 2.930e+00;
## best it: 140; best obj: 1.491e+00
## It: 206; obj: 1.522e+00; abs: 9.765e-03; rel: 6.459e-03; norm: 1.395e-01; mom: 3.053e+00;
## best it: 140; best obj: 1.491e+00
## It: 207; obj: 1.519e+00; abs: 2.841e-03; rel: 1.867e-03; norm: 1.397e-01; mom: 2.971e+00;
## best it: 140; best obj: 1.491e+00
## It: 208; obj: 1.497e+00; abs: 2.186e-02; rel: 1.439e-02; norm: 1.409e-01; mom: 3.007e+00;
## best it: 140; best obj: 1.491e+00
## It: 209; obj: 1.482e+00; abs: 1.486e-02; rel: 9.927e-03; norm: 1.399e-01; mom: 3.246e+00;
## best it: 209; best obj: 1.482e+00
## It: 210; obj: 1.493e+00; abs: 1.151e-02; rel: 7.768e-03; norm: 1.400e-01; mom: 2.650e+00;
## best it: 209; best obj: 1.482e+00
## It: 211; obj: 1.521e+00; abs: 2.765e-02; rel: 1.852e-02; norm: 1.398e-01; mom: 2.598e+00;
## best it: 209; best obj: 1.482e+00
## It: 212; obj: 1.509e+00; abs: 1.258e-02; rel: 8.273e-03; norm: 1.402e-01; mom: 2.867e+00;
## best it: 209; best obj: 1.482e+00
## It: 213; obj: 1.492e+00; abs: 1.686e-02; rel: 1.117e-02; norm: 1.395e-01; mom: 2.998e+00;
## best it: 209; best obj: 1.482e+00
## It: 214; obj: 1.492e+00; abs: 7.638e-05; rel: 5.120e-05; norm: 1.402e-01; mom: 2.844e+00;
## best it: 209; best obj: 1.482e+00
## It: 215; obj: 1.487e+00; abs: 5.217e-03; rel: 3.497e-03; norm: 1.407e-01; mom: 3.243e+00;
## best it: 209; best obj: 1.482e+00
## It: 216; obj: 1.514e+00; abs: 2.701e-02; rel: 1.817e-02; norm: 1.406e-01; mom: 2.617e+00;
## best it: 209; best obj: 1.482e+00
## It: 217; obj: 1.539e+00; abs: 2.540e-02; rel: 1.678e-02; norm: 1.428e-01; mom: 3.033e+00;
## best it: 209; best obj: 1.482e+00
## It: 218; obj: 1.528e+00; abs: 1.108e-02; rel: 7.200e-03; norm: 1.414e-01; mom: 3.567e+00;
## best it: 209; best obj: 1.482e+00
## It: 219; obj: 1.527e+00; abs: 5.216e-04; rel: 3.414e-04; norm: 1.419e-01; mom: 3.241e+00;
## best it: 209; best obj: 1.482e+00
## It: 220; obj: 1.524e+00; abs: 3.194e-03; rel: 2.091e-03; norm: 1.423e-01; mom: 3.518e+00;

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## best it: 209; best obj: 1.482e+00
## It: 221; obj: 1.510e+00; abs: 1.460e-02; rel: 9.577e-03; norm: 1.403e-01; mom: 3.493e+00;
## best it: 209; best obj: 1.482e+00
## It: 222; obj: 1.511e+00; abs: 9.978e-04; rel: 6.609e-04; norm: 1.416e-01; mom: 3.037e+00;
## best it: 209; best obj: 1.482e+00
## It: 223; obj: 1.536e+00; abs: 2.540e-02; rel: 1.682e-02; norm: 1.415e-01; mom: 3.082e+00;
## best it: 209; best obj: 1.482e+00
## It: 224; obj: 1.527e+00; abs: 9.113e-03; rel: 5.933e-03; norm: 1.406e-01; mom: 3.336e+00;
## best it: 209; best obj: 1.482e+00
## It: 225; obj: 1.521e+00; abs: 6.298e-03; rel: 4.125e-03; norm: 1.421e-01; mom: 3.168e+00;
## best it: 209; best obj: 1.482e+00

## It: 226; obj: 1.544e+00; abs: 2.348e-02; rel: 1.544e-02; norm: 1.408e-01; mom: 3.363e+00;
## best it: 209; best obj: 1.482e+00
## It: 227; obj: 1.537e+00; abs: 7.221e-03; rel: 4.677e-03; norm: 1.416e-01; mom: 3.526e+00;
## best it: 209; best obj: 1.482e+00
## It: 228; obj: 1.535e+00; abs: 1.554e-03; rel: 1.011e-03; norm: 1.421e-01; mom: 3.368e+00;
## best it: 209; best obj: 1.482e+00
## It: 229; obj: 1.551e+00; abs: 1.552e-02; rel: 1.011e-02; norm: 1.427e-01; mom: 3.329e+00;
## best it: 209; best obj: 1.482e+00
## It: 230; obj: 1.537e+00; abs: 1.382e-02; rel: 8.909e-03; norm: 1.411e-01; mom: 3.808e+00;
## best it: 209; best obj: 1.482e+00
## It: 231; obj: 1.533e+00; abs: 4.201e-03; rel: 2.733e-03; norm: 1.408e-01; mom: 3.605e+00;
## best it: 209; best obj: 1.482e+00
## It: 232; obj: 1.547e+00; abs: 1.448e-02; rel: 9.445e-03; norm: 1.402e-01; mom: 3.295e+00;
## best it: 209; best obj: 1.482e+00
## It: 233; obj: 1.554e+00; abs: 6.491e-03; rel: 4.195e-03; norm: 1.406e-01; mom: 3.249e+00;
## best it: 209; best obj: 1.482e+00
## It: 234; obj: 1.527e+00; abs: 2.665e-02; rel: 1.715e-02; norm: 1.412e-01; mom: 3.693e+00;
## best it: 209; best obj: 1.482e+00
## It: 235; obj: 1.522e+00; abs: 4.738e-03; rel: 3.103e-03; norm: 1.406e-01; mom: 3.760e+00;
## best it: 209; best obj: 1.482e+00
## It: 236; obj: 1.519e+00; abs: 3.438e-03; rel: 2.258e-03; norm: 1.397e-01; mom: 3.414e+00;
## best it: 209; best obj: 1.482e+00
## It: 237; obj: 1.530e+00; abs: 1.108e-02; rel: 7.297e-03; norm: 1.400e-01; mom: 3.101e+00;
## best it: 209; best obj: 1.482e+00
## It: 238; obj: 1.544e+00; abs: 1.405e-02; rel: 9.186e-03; norm: 1.417e-01; mom: 2.935e+00;
## best it: 209; best obj: 1.482e+00
## It: 239; obj: 1.524e+00; abs: 1.996e-02; rel: 1.293e-02; norm: 1.397e-01; mom: 3.572e+00;
## best it: 209; best obj: 1.482e+00
## It: 240; obj: 1.533e+00; abs: 9.227e-03; rel: 6.054e-03; norm: 1.403e-01; mom: 3.280e+00;
## best it: 209; best obj: 1.482e+00
## It: 241; obj: 1.543e+00; abs: 1.010e-02; rel: 6.588e-03; norm: 1.402e-01; mom: 3.199e+00;
## best it: 209; best obj: 1.482e+00
## It: 242; obj: 1.541e+00; abs: 2.294e-03; rel: 1.486e-03; norm: 1.396e-01; mom: 3.381e+00;
## best it: 209; best obj: 1.482e+00
## It: 243; obj: 1.525e+00; abs: 1.627e-02; rel: 1.056e-02; norm: 1.407e-01; mom: 3.236e+00;
## best it: 209; best obj: 1.482e+00
## It: 244; obj: 1.526e+00; abs: 1.436e-03; rel: 9.418e-04; norm: 1.394e-01; mom: 3.427e+00;
## best it: 209; best obj: 1.482e+00
## It: 245; obj: 1.523e+00; abs: 2.801e-03; rel: 1.835e-03; norm: 1.385e-01; mom: 2.883e+00;
## best it: 209; best obj: 1.482e+00
## It: 246; obj: 1.542e+00; abs: 1.822e-02; rel: 1.196e-02; norm: 1.408e-01; mom: 2.817e+00;
## best it: 209; best obj: 1.482e+00

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## It: 247; obj: 1.535e+00; abs: 7.045e-03; rel: 4.570e-03; norm: 1.413e-01; mom: 3.642e+00;
## best it: 209; best obj: 1.482e+00
## It: 248; obj: 1.518e+00; abs: 1.653e-02; rel: 1.077e-02; norm: 1.410e-01; mom: 5.507e+00;
## best it: 209; best obj: 1.482e+00
## It: 249; obj: 1.519e+00; abs: 8.375e-04; rel: 5.517e-04; norm: 1.397e-01; mom: 4.355e+00;
## best it: 209; best obj: 1.482e+00
## It: 250; obj: 1.517e+00; abs: 2.302e-03; rel: 1.515e-03; norm: 1.407e-01; mom: 4.591e+00;
## best it: 209; best obj: 1.482e+00

## It: 251; obj: 1.506e+00; abs: 1.061e-02; rel: 6.995e-03; norm: 1.405e-01; mom: 5.042e+00;
## best it: 209; best obj: 1.482e+00
## It: 252; obj: 1.533e+00; abs: 2.654e-02; rel: 1.762e-02; norm: 1.395e-01; mom: 4.553e+00;
## best it: 209; best obj: 1.482e+00
## It: 253; obj: 1.519e+00; abs: 1.407e-02; rel: 9.177e-03; norm: 1.394e-01; mom: 5.142e+00;
## best it: 209; best obj: 1.482e+00
## It: 254; obj: 1.491e+00; abs: 2.719e-02; rel: 1.791e-02; norm: 1.391e-01; mom: 4.759e+00;
## best it: 209; best obj: 1.482e+00
## It: 255; obj: 1.495e+00; abs: 4.089e-03; rel: 2.742e-03; norm: 1.394e-01; mom: 4.110e+00;
## best it: 209; best obj: 1.482e+00
## It: 256; obj: 1.520e+00; abs: 2.503e-02; rel: 1.674e-02; norm: 1.395e-01; mom: 4.230e+00;
## best it: 209; best obj: 1.482e+00
## It: 257; obj: 1.506e+00; abs: 1.472e-02; rel: 9.680e-03; norm: 1.399e-01; mom: 4.500e+00;
## best it: 209; best obj: 1.482e+00
## It: 258; obj: 1.502e+00; abs: 4.194e-03; rel: 2.785e-03; norm: 1.407e-01; mom: 4.544e+00;
## best it: 209; best obj: 1.482e+00
## It: 259; obj: 1.512e+00; abs: 1.016e-02; rel: 6.765e-03; norm: 1.390e-01; mom: 4.271e+00;
## best it: 209; best obj: 1.482e+00
## It: 260; obj: 1.509e+00; abs: 2.262e-03; rel: 1.496e-03; norm: 1.391e-01; mom: 4.661e+00;
## best it: 209; best obj: 1.482e+00
## It: 261; obj: 1.512e+00; abs: 2.082e-03; rel: 1.380e-03; norm: 1.407e-01; mom: 4.393e+00;
## best it: 209; best obj: 1.482e+00
## It: 262; obj: 1.518e+00; abs: 6.409e-03; rel: 4.240e-03; norm: 1.403e-01; mom: 4.803e+00;
## best it: 209; best obj: 1.482e+00
## It: 263; obj: 1.506e+00; abs: 1.204e-02; rel: 7.929e-03; norm: 1.404e-01; mom: 4.848e+00;
## best it: 209; best obj: 1.482e+00
## It: 264; obj: 1.510e+00; abs: 4.129e-03; rel: 2.742e-03; norm: 1.402e-01; mom: 4.189e+00;
## best it: 209; best obj: 1.482e+00
## It: 265; obj: 1.506e+00; abs: 4.442e-03; rel: 2.941e-03; norm: 1.404e-01; mom: 4.230e+00;
## best it: 209; best obj: 1.482e+00
## It: 266; obj: 1.505e+00; abs: 1.958e-04; rel: 1.301e-04; norm: 1.405e-01; mom: 4.348e+00;
## best it: 209; best obj: 1.482e+00
## It: 267; obj: 1.510e+00; abs: 4.664e-03; rel: 3.098e-03; norm: 1.410e-01; mom: 4.090e+00;
## best it: 209; best obj: 1.482e+00
## It: 268; obj: 1.524e+00; abs: 1.440e-02; rel: 9.537e-03; norm: 1.405e-01; mom: 4.439e+00;
## best it: 209; best obj: 1.482e+00
## It: 269; obj: 1.526e+00; abs: 1.071e-03; rel: 7.023e-04; norm: 1.404e-01; mom: 4.743e+00;
## best it: 209; best obj: 1.482e+00
## It: 270; obj: 1.520e+00; abs: 5.972e-03; rel: 3.915e-03; norm: 1.409e-01; mom: 4.636e+00;
## best it: 209; best obj: 1.482e+00
## It: 271; obj: 1.513e+00; abs: 6.367e-03; rel: 4.190e-03; norm: 1.408e-01; mom: 4.487e+00;
## best it: 209; best obj: 1.482e+00
## It: 272; obj: 1.498e+00; abs: 1.473e-02; rel: 9.735e-03; norm: 1.402e-01; mom: 4.610e+00;
## best it: 209; best obj: 1.482e+00
## It: 273; obj: 1.514e+00; abs: 1.596e-02; rel: 1.065e-02; norm: 1.395e-01; mom: 3.896e+00;

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## best it: 209; best obj: 1.482e+00
## It: 274; obj: 1.527e+00; abs: 1.269e-02; rel: 8.379e-03; norm: 1.407e-01; mom: 4.393e+00;
## best it: 209; best obj: 1.482e+00
## It: 275; obj: 1.509e+00; abs: 1.810e-02; rel: 1.185e-02; norm: 1.404e-01; mom: 4.454e+00;
## best it: 209; best obj: 1.482e+00

## It: 276; obj: 1.527e+00; abs: 1.748e-02; rel: 1.158e-02; norm: 1.397e-01; mom: 4.938e+00;
## best it: 209; best obj: 1.482e+00
## It: 277; obj: 1.519e+00; abs: 7.055e-03; rel: 4.622e-03; norm: 1.403e-01; mom: 4.057e+00;
## best it: 209; best obj: 1.482e+00
## It: 278; obj: 1.515e+00; abs: 4.041e-03; rel: 2.660e-03; norm: 1.398e-01; mom: 5.033e+00;
## best it: 209; best obj: 1.482e+00
## It: 279; obj: 1.507e+00; abs: 8.019e-03; rel: 5.292e-03; norm: 1.398e-01; mom: 4.500e+00;
## best it: 209; best obj: 1.482e+00
## It: 280; obj: 1.525e+00; abs: 1.787e-02; rel: 1.186e-02; norm: 1.400e-01; mom: 4.419e+00;
## best it: 209; best obj: 1.482e+00
## It: 281; obj: 1.529e+00; abs: 3.547e-03; rel: 2.325e-03; norm: 1.399e-01; mom: 4.375e+00;
## best it: 209; best obj: 1.482e+00
## It: 282; obj: 1.525e+00; abs: 3.312e-03; rel: 2.167e-03; norm: 1.404e-01; mom: 4.948e+00;
## best it: 209; best obj: 1.482e+00
## It: 283; obj: 1.513e+00; abs: 1.219e-02; rel: 7.989e-03; norm: 1.399e-01; mom: 4.904e+00;
## best it: 209; best obj: 1.482e+00
## It: 284; obj: 1.496e+00; abs: 1.688e-02; rel: 1.115e-02; norm: 1.390e-01; mom: 4.823e+00;
## best it: 209; best obj: 1.482e+00
## It: 285; obj: 1.500e+00; abs: 3.273e-03; rel: 2.187e-03; norm: 1.398e-01; mom: 3.987e+00;
## best it: 209; best obj: 1.482e+00
## It: 286; obj: 1.531e+00; abs: 3.109e-02; rel: 2.073e-02; norm: 1.407e-01; mom: 4.113e+00;
## best it: 209; best obj: 1.482e+00
## It: 287; obj: 1.506e+00; abs: 2.437e-02; rel: 1.592e-02; norm: 1.396e-01; mom: 4.636e+00;
## best it: 209; best obj: 1.482e+00
## It: 288; obj: 1.500e+00; abs: 6.058e-03; rel: 4.021e-03; norm: 1.387e-01; mom: 4.425e+00;
## best it: 209; best obj: 1.482e+00
## It: 289; obj: 1.523e+00; abs: 2.236e-02; rel: 1.491e-02; norm: 1.401e-01; mom: 4.320e+00;
## best it: 209; best obj: 1.482e+00
## It: 290; obj: 1.524e+00; abs: 1.515e-03; rel: 9.950e-04; norm: 1.405e-01; mom: 4.934e+00;
## best it: 209; best obj: 1.482e+00
## It: 291; obj: 1.508e+00; abs: 1.586e-02; rel: 1.041e-02; norm: 1.403e-01; mom: 4.959e+00;
## best it: 209; best obj: 1.482e+00
## It: 292; obj: 1.504e+00; abs: 4.102e-03; rel: 2.719e-03; norm: 1.401e-01; mom: 4.026e+00;
## best it: 209; best obj: 1.482e+00
## It: 293; obj: 1.497e+00; abs: 7.694e-03; rel: 5.115e-03; norm: 1.395e-01; mom: 4.934e+00;
## best it: 209; best obj: 1.482e+00
## It: 294; obj: 1.502e+00; abs: 5.545e-03; rel: 3.705e-03; norm: 1.389e-01; mom: 4.281e+00;
## best it: 209; best obj: 1.482e+00
## It: 295; obj: 1.517e+00; abs: 1.477e-02; rel: 9.831e-03; norm: 1.408e-01; mom: 4.153e+00;
## best it: 209; best obj: 1.482e+00
## It: 296; obj: 1.508e+00; abs: 8.997e-03; rel: 5.931e-03; norm: 1.406e-01; mom: 4.820e+00;
## best it: 209; best obj: 1.482e+00
## It: 297; obj: 1.488e+00; abs: 1.995e-02; rel: 1.323e-02; norm: 1.410e-01; mom: 4.923e+00;
## best it: 209; best obj: 1.482e+00
## It: 298; obj: 1.496e+00; abs: 7.661e-03; rel: 5.148e-03; norm: 1.397e-01; mom: 4.134e+00;
## best it: 209; best obj: 1.482e+00
## It: 299; obj: 1.516e+00; abs: 2.040e-02; rel: 1.364e-02; norm: 1.405e-01; mom: 4.391e+00;
## best it: 209; best obj: 1.482e+00

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## It: 300; obj: 1.510e+00; abs: 6.304e-03; rel: 4.158e-03; norm: 1.395e-01; mom: 5.408e+00;
## best it: 209; best obj: 1.482e+00

## It: 301; obj: 1.508e+00; abs: 2.150e-03; rel: 1.424e-03; norm: 1.398e-01; mom: 4.939e+00;
## best it: 209; best obj: 1.482e+00

## It: 302; obj: 1.493e+00; abs: 1.476e-02; rel: 9.791e-03; norm: 1.400e-01; mom: 4.392e+00;
## best it: 209; best obj: 1.482e+00

## It: 303; obj: 1.491e+00; abs: 2.032e-03; rel: 1.361e-03; norm: 1.396e-01; mom: 4.489e+00;
## best it: 209; best obj: 1.482e+00

## It: 304; obj: 1.494e+00; abs: 3.255e-03; rel: 2.183e-03; norm: 1.395e-01; mom: 4.027e+00;
## best it: 209; best obj: 1.482e+00

## It: 305; obj: 1.493e+00; abs: 5.734e-04; rel: 3.838e-04; norm: 1.404e-01; mom: 4.559e+00;
## best it: 209; best obj: 1.482e+00

## It: 306; obj: 1.494e+00; abs: 7.936e-04; rel: 5.314e-04; norm: 1.402e-01; mom: 4.381e+00;
## best it: 209; best obj: 1.482e+00

## It: 307; obj: 1.496e+00; abs: 2.066e-03; rel: 1.383e-03; norm: 1.405e-01; mom: 4.330e+00;
## best it: 209; best obj: 1.482e+00

## It: 308; obj: 1.480e+00; abs: 1.660e-02; rel: 1.110e-02; norm: 1.412e-01; mom: 4.606e+00;
## best it: 308; best obj: 1.480e+00

## It: 309; obj: 1.482e+00; abs: 2.410e-03; rel: 1.629e-03; norm: 1.410e-01; mom: 4.200e+00;
## best it: 308; best obj: 1.480e+00

## It: 310; obj: 1.504e+00; abs: 2.180e-02; rel: 1.471e-02; norm: 1.393e-01; mom: 3.888e+00;
## best it: 308; best obj: 1.480e+00

## It: 311; obj: 1.496e+00; abs: 7.622e-03; rel: 5.068e-03; norm: 1.407e-01; mom: 4.319e+00;
## best it: 308; best obj: 1.480e+00

## It: 312; obj: 1.485e+00; abs: 1.175e-02; rel: 7.851e-03; norm: 1.403e-01; mom: 4.777e+00;
## best it: 308; best obj: 1.480e+00

## It: 313; obj: 1.483e+00; abs: 1.941e-03; rel: 1.308e-03; norm: 1.404e-01; mom: 4.203e+00;
## best it: 308; best obj: 1.480e+00

## It: 314; obj: 1.488e+00; abs: 5.678e-03; rel: 3.830e-03; norm: 1.389e-01; mom: 3.462e+00;
## best it: 308; best obj: 1.480e+00

## It: 315; obj: 1.482e+00; abs: 6.377e-03; rel: 4.284e-03; norm: 1.395e-01; mom: 4.361e+00;
## best it: 308; best obj: 1.480e+00

## It: 316; obj: 1.481e+00; abs: 5.101e-04; rel: 3.442e-04; norm: 1.393e-01; mom: 3.662e+00;
## best it: 308; best obj: 1.480e+00

## It: 317; obj: 1.497e+00; abs: 1.579e-02; rel: 1.066e-02; norm: 1.402e-01; mom: 3.495e+00;
## best it: 308; best obj: 1.480e+00

## It: 318; obj: 1.505e+00; abs: 7.703e-03; rel: 5.145e-03; norm: 1.407e-01; mom: 4.189e+00;
## best it: 308; best obj: 1.480e+00

## It: 319; obj: 1.488e+00; abs: 1.694e-02; rel: 1.126e-02; norm: 1.394e-01; mom: 4.061e+00;
## best it: 308; best obj: 1.480e+00

## It: 320; obj: 1.492e+00; abs: 4.530e-03; rel: 3.044e-03; norm: 1.405e-01; mom: 4.400e+00;
## best it: 308; best obj: 1.480e+00

## It: 321; obj: 1.503e+00; abs: 1.073e-02; rel: 7.190e-03; norm: 1.411e-01; mom: 4.147e+00;
## best it: 308; best obj: 1.480e+00

## It: 322; obj: 1.511e+00; abs: 7.413e-03; rel: 4.931e-03; norm: 1.402e-01; mom: 4.254e+00;
## best it: 308; best obj: 1.480e+00

## It: 323; obj: 1.496e+00; abs: 1.430e-02; rel: 9.465e-03; norm: 1.395e-01; mom: 4.128e+00;
## best it: 308; best obj: 1.480e+00

## It: 324; obj: 1.500e+00; abs: 3.421e-03; rel: 2.286e-03; norm: 1.397e-01; mom: 4.971e+00;
## best it: 308; best obj: 1.480e+00

## It: 325; obj: 1.503e+00; abs: 3.656e-03; rel: 2.438e-03; norm: 1.394e-01; mom: 3.843e+00;
## best it: 308; best obj: 1.480e+00

## It: 326; obj: 1.513e+00; abs: 9.538e-03; rel: 6.344e-03; norm: 1.404e-01; mom: 4.122e+00;

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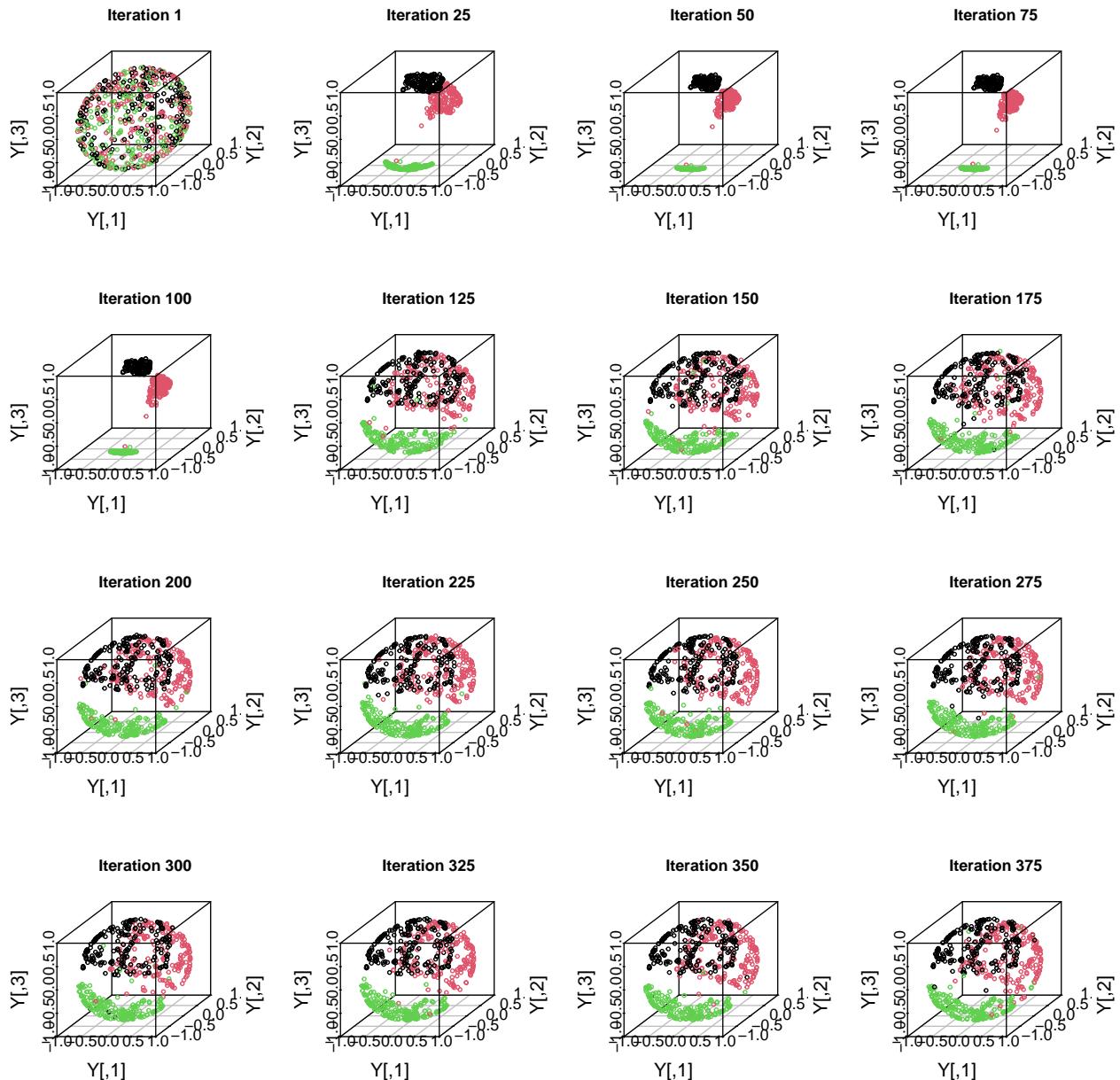
## best it: 308; best obj: 1.480e+00
## It: 327; obj: 1.509e+00; abs: 4.095e-03; rel: 2.707e-03; norm: 1.414e-01; mom: 4.713e+00;
## best it: 308; best obj: 1.480e+00
## It: 328; obj: 1.522e+00; abs: 1.328e-02; rel: 8.802e-03; norm: 1.412e-01; mom: 4.342e+00;
## best it: 308; best obj: 1.480e+00
## It: 329; obj: 1.514e+00; abs: 7.794e-03; rel: 5.120e-03; norm: 1.413e-01; mom: 4.731e+00;
## best it: 308; best obj: 1.480e+00
## It: 330; obj: 1.499e+00; abs: 1.527e-02; rel: 1.008e-02; norm: 1.402e-01; mom: 4.949e+00;
## best it: 308; best obj: 1.480e+00
## It: 331; obj: 1.505e+00; abs: 6.263e-03; rel: 4.178e-03; norm: 1.395e-01; mom: 3.965e+00;
## best it: 308; best obj: 1.480e+00
## It: 332; obj: 1.508e+00; abs: 2.542e-03; rel: 1.689e-03; norm: 1.404e-01; mom: 4.264e+00;
## best it: 308; best obj: 1.480e+00
## It: 333; obj: 1.510e+00; abs: 2.104e-03; rel: 1.395e-03; norm: 1.405e-01; mom: 5.207e+00;
## best it: 308; best obj: 1.480e+00
## It: 334; obj: 1.514e+00; abs: 4.448e-03; rel: 2.946e-03; norm: 1.400e-01; mom: 3.949e+00;
## best it: 308; best obj: 1.480e+00
## It: 335; obj: 1.512e+00; abs: 2.568e-03; rel: 1.696e-03; norm: 1.404e-01; mom: 4.790e+00;
## best it: 308; best obj: 1.480e+00
## It: 336; obj: 1.509e+00; abs: 2.731e-03; rel: 1.807e-03; norm: 1.415e-01; mom: 4.517e+00;
## best it: 308; best obj: 1.480e+00
## It: 337; obj: 1.514e+00; abs: 4.962e-03; rel: 3.288e-03; norm: 1.409e-01; mom: 4.456e+00;
## best it: 308; best obj: 1.480e+00
## It: 338; obj: 1.513e+00; abs: 1.186e-03; rel: 7.832e-04; norm: 1.412e-01; mom: 4.707e+00;
## best it: 308; best obj: 1.480e+00
## It: 339; obj: 1.492e+00; abs: 2.108e-02; rel: 1.394e-02; norm: 1.394e-01; mom: 4.933e+00;
## best it: 308; best obj: 1.480e+00
## It: 340; obj: 1.507e+00; abs: 1.538e-02; rel: 1.031e-02; norm: 1.399e-01; mom: 4.182e+00;
## best it: 308; best obj: 1.480e+00
## It: 341; obj: 1.517e+00; abs: 1.016e-02; rel: 6.741e-03; norm: 1.408e-01; mom: 4.301e+00;
## best it: 308; best obj: 1.480e+00
## It: 342; obj: 1.497e+00; abs: 2.020e-02; rel: 1.331e-02; norm: 1.400e-01; mom: 5.099e+00;
## best it: 308; best obj: 1.480e+00
## It: 343; obj: 1.498e+00; abs: 8.244e-04; rel: 5.506e-04; norm: 1.390e-01; mom: 4.023e+00;
## best it: 308; best obj: 1.480e+00
## It: 344; obj: 1.516e+00; abs: 1.779e-02; rel: 1.187e-02; norm: 1.407e-01; mom: 3.904e+00;
## best it: 308; best obj: 1.480e+00
## It: 345; obj: 1.521e+00; abs: 5.691e-03; rel: 3.755e-03; norm: 1.404e-01; mom: 4.442e+00;
## best it: 308; best obj: 1.480e+00
## It: 346; obj: 1.523e+00; abs: 1.654e-03; rel: 1.087e-03; norm: 1.400e-01; mom: 4.812e+00;
## best it: 308; best obj: 1.480e+00
## It: 347; obj: 1.503e+00; abs: 2.015e-02; rel: 1.323e-02; norm: 1.401e-01; mom: 5.146e+00;
## best it: 308; best obj: 1.480e+00
## It: 348; obj: 1.512e+00; abs: 8.805e-03; rel: 5.858e-03; norm: 1.409e-01; mom: 4.646e+00;
## best it: 308; best obj: 1.480e+00
## It: 349; obj: 1.506e+00; abs: 5.389e-03; rel: 3.565e-03; norm: 1.402e-01; mom: 4.671e+00;
## best it: 308; best obj: 1.480e+00
## It: 350; obj: 1.506e+00; abs: 2.634e-04; rel: 1.748e-04; norm: 1.393e-01; mom: 4.173e+00;
## best it: 308; best obj: 1.480e+00
## It: 351; obj: 1.513e+00; abs: 7.277e-03; rel: 4.832e-03; norm: 1.403e-01; mom: 4.536e+00;
## best it: 308; best obj: 1.480e+00
## It: 352; obj: 1.510e+00; abs: 2.909e-03; rel: 1.922e-03; norm: 1.392e-01; mom: 4.271e+00;
## best it: 308; best obj: 1.480e+00

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## It: 353; obj: 1.517e+00; abs: 6.985e-03; rel: 4.625e-03; norm: 1.401e-01; mom: 4.497e+00;
## best it: 308; best obj: 1.480e+00
## It: 354; obj: 1.504e+00; abs: 1.339e-02; rel: 8.823e-03; norm: 1.401e-01; mom: 4.780e+00;
## best it: 308; best obj: 1.480e+00
## It: 355; obj: 1.501e+00; abs: 2.636e-03; rel: 1.753e-03; norm: 1.403e-01; mom: 4.614e+00;
## best it: 308; best obj: 1.480e+00
## It: 356; obj: 1.513e+00; abs: 1.115e-02; rel: 7.424e-03; norm: 1.399e-01; mom: 4.229e+00;
## best it: 308; best obj: 1.480e+00
## It: 357; obj: 1.499e+00; abs: 1.383e-02; rel: 9.146e-03; norm: 1.409e-01; mom: 4.574e+00;
## best it: 308; best obj: 1.480e+00
## It: 358; obj: 1.508e+00; abs: 9.503e-03; rel: 6.340e-03; norm: 1.392e-01; mom: 4.375e+00;
## best it: 308; best obj: 1.480e+00
## It: 359; obj: 1.520e+00; abs: 1.158e-02; rel: 7.677e-03; norm: 1.402e-01; mom: 4.320e+00;
## best it: 308; best obj: 1.480e+00
## It: 360; obj: 1.503e+00; abs: 1.716e-02; rel: 1.129e-02; norm: 1.409e-01; mom: 4.669e+00;
## best it: 308; best obj: 1.480e+00
## It: 361; obj: 1.493e+00; abs: 1.011e-02; rel: 6.730e-03; norm: 1.408e-01; mom: 4.834e+00;
## best it: 308; best obj: 1.480e+00
## It: 362; obj: 1.505e+00; abs: 1.259e-02; rel: 8.438e-03; norm: 1.402e-01; mom: 4.149e+00;
## best it: 308; best obj: 1.480e+00
## It: 363; obj: 1.509e+00; abs: 3.455e-03; rel: 2.296e-03; norm: 1.400e-01; mom: 4.230e+00;
## best it: 308; best obj: 1.480e+00
## It: 364; obj: 1.501e+00; abs: 7.310e-03; rel: 4.846e-03; norm: 1.389e-01; mom: 4.150e+00;
## best it: 308; best obj: 1.480e+00
## It: 365; obj: 1.493e+00; abs: 8.085e-03; rel: 5.385e-03; norm: 1.391e-01; mom: 3.973e+00;
## best it: 308; best obj: 1.480e+00
## It: 366; obj: 1.502e+00; abs: 8.746e-03; rel: 5.857e-03; norm: 1.385e-01; mom: 4.082e+00;
## best it: 308; best obj: 1.480e+00
## It: 367; obj: 1.493e+00; abs: 8.711e-03; rel: 5.800e-03; norm: 1.393e-01; mom: 4.353e+00;
## best it: 308; best obj: 1.480e+00
## It: 368; obj: 1.502e+00; abs: 9.165e-03; rel: 6.138e-03; norm: 1.394e-01; mom: 3.995e+00;
## best it: 308; best obj: 1.480e+00
## It: 369; obj: 1.513e+00; abs: 1.044e-02; rel: 6.947e-03; norm: 1.388e-01; mom: 3.714e+00;
## best it: 308; best obj: 1.480e+00
## It: 370; obj: 1.510e+00; abs: 2.363e-03; rel: 1.562e-03; norm: 1.394e-01; mom: 4.053e+00;
## best it: 308; best obj: 1.480e+00
## It: 371; obj: 1.524e+00; abs: 1.372e-02; rel: 9.084e-03; norm: 1.397e-01; mom: 4.181e+00;
## best it: 308; best obj: 1.480e+00
## It: 372; obj: 1.512e+00; abs: 1.203e-02; rel: 7.891e-03; norm: 1.404e-01; mom: 3.951e+00;
## best it: 308; best obj: 1.480e+00
## It: 373; obj: 1.502e+00; abs: 1.064e-02; rel: 7.036e-03; norm: 1.393e-01; mom: 4.282e+00;
## best it: 308; best obj: 1.480e+00
## It: 374; obj: 1.523e+00; abs: 2.128e-02; rel: 1.417e-02; norm: 1.400e-01; mom: 4.346e+00;
## best it: 308; best obj: 1.480e+00
## It: 375; obj: 1.529e+00; abs: 5.953e-03; rel: 3.909e-03; norm: 1.403e-01; mom: 4.215e+00;
## best it: 308; best obj: 1.480e+00

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## It: 376; obj: 1.511e+00; abs: 1.743e-02; rel: 1.140e-02; norm: 1.392e-01; mom: 4.594e+00;
## best it: 308; best obj: 1.480e+00
## It: 377; obj: 1.513e+00; abs: 1.447e-03; rel: 9.576e-04; norm: 1.397e-01; mom: 4.319e+00;
## best it: 308; best obj: 1.480e+00
## It: 378; obj: 1.525e+00; abs: 1.235e-02; rel: 8.164e-03; norm: 1.407e-01; mom: 4.469e+00;
## best it: 308; best obj: 1.480e+00
## It: 379; obj: 1.521e+00; abs: 4.318e-03; rel: 2.831e-03; norm: 1.402e-01; mom: 4.719e+00;
## best it: 308; best obj: 1.480e+00
## It: 380; obj: 1.508e+00; abs: 1.315e-02; rel: 8.644e-03; norm: 1.395e-01; mom: 4.582e+00;
## best it: 308; best obj: 1.480e+00
## It: 381; obj: 1.508e+00; abs: 1.377e-04; rel: 9.136e-05; norm: 1.404e-01; mom: 4.207e+00;
## best it: 308; best obj: 1.480e+00
## It: 382; obj: 1.512e+00; abs: 3.916e-03; rel: 2.597e-03; norm: 1.396e-01; mom: 3.913e+00;
## best it: 308; best obj: 1.480e+00
## It: 383; obj: 1.521e+00; abs: 8.920e-03; rel: 5.901e-03; norm: 1.393e-01; mom: 4.857e+00;

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## best it: 308; best obj: 1.480e+00
## It: 384; obj: 1.522e+00; abs: 1.597e-03; rel: 1.050e-03; norm: 1.388e-01; mom: 3.935e+00;
## best it: 308; best obj: 1.480e+00
## It: 385; obj: 1.521e+00; abs: 1.300e-03; rel: 8.542e-04; norm: 1.402e-01; mom: 4.575e+00;
## best it: 308; best obj: 1.480e+00
## It: 386; obj: 1.513e+00; abs: 7.716e-03; rel: 5.073e-03; norm: 1.413e-01; mom: 4.672e+00;
## best it: 308; best obj: 1.480e+00
## It: 387; obj: 1.502e+00; abs: 1.089e-02; rel: 7.195e-03; norm: 1.393e-01; mom: 4.740e+00;
## best it: 308; best obj: 1.480e+00
## It: 388; obj: 1.507e+00; abs: 4.659e-03; rel: 3.101e-03; norm: 1.391e-01; mom: 3.850e+00;
## best it: 308; best obj: 1.480e+00
## It: 389; obj: 1.509e+00; abs: 2.405e-03; rel: 1.596e-03; norm: 1.407e-01; mom: 4.391e+00;
## best it: 308; best obj: 1.480e+00
## It: 390; obj: 1.503e+00; abs: 6.660e-03; rel: 4.412e-03; norm: 1.390e-01; mom: 4.973e+00;
## best it: 308; best obj: 1.480e+00
## It: 391; obj: 1.504e+00; abs: 1.279e-03; rel: 8.508e-04; norm: 1.395e-01; mom: 3.849e+00;
## best it: 308; best obj: 1.480e+00
## It: 392; obj: 1.507e+00; abs: 3.259e-03; rel: 2.167e-03; norm: 1.394e-01; mom: 3.949e+00;
## best it: 308; best obj: 1.480e+00
## It: 393; obj: 1.492e+00; abs: 1.567e-02; rel: 1.040e-02; norm: 1.395e-01; mom: 3.859e+00;
## best it: 308; best obj: 1.480e+00
## It: 394; obj: 1.485e+00; abs: 6.862e-03; rel: 4.600e-03; norm: 1.397e-01; mom: 4.097e+00;
## best it: 308; best obj: 1.480e+00
## It: 395; obj: 1.505e+00; abs: 1.987e-02; rel: 1.338e-02; norm: 1.410e-01; mom: 3.482e+00;
## best it: 308; best obj: 1.480e+00
## It: 396; obj: 1.502e+00; abs: 2.588e-03; rel: 1.720e-03; norm: 1.404e-01; mom: 4.194e+00;
## best it: 308; best obj: 1.480e+00
## It: 397; obj: 1.486e+00; abs: 1.623e-02; rel: 1.080e-02; norm: 1.393e-01; mom: 3.934e+00;
## best it: 308; best obj: 1.480e+00
## It: 398; obj: 1.491e+00; abs: 4.917e-03; rel: 3.309e-03; norm: 1.397e-01; mom: 3.823e+00;
## best it: 308; best obj: 1.480e+00
## It: 399; obj: 1.509e+00; abs: 1.793e-02; rel: 1.203e-02; norm: 1.407e-01; mom: 3.549e+00;
## best it: 308; best obj: 1.480e+00
## It: 400; obj: 1.510e+00; abs: 1.068e-03; rel: 7.080e-04; norm: 1.401e-01; mom: 4.434e+00;
## best it: 308; best obj: 1.480e+00

## It: 401; obj: 1.506e+00; abs: 3.890e-03; rel: 2.576e-03; norm: 1.403e-01; mom: 3.818e+00;
## best it: 308; best obj: 1.480e+00
## It: 402; obj: 1.500e+00; abs: 5.636e-03; rel: 3.743e-03; norm: 1.400e-01; mom: 4.205e+00;
## best it: 308; best obj: 1.480e+00
## It: 403; obj: 1.517e+00; abs: 1.674e-02; rel: 1.116e-02; norm: 1.392e-01; mom: 4.242e+00;
## best it: 308; best obj: 1.480e+00
## It: 404; obj: 1.502e+00; abs: 1.521e-02; rel: 1.003e-02; norm: 1.401e-01; mom: 4.099e+00;
## best it: 308; best obj: 1.480e+00
## It: 405; obj: 1.498e+00; abs: 3.265e-03; rel: 2.174e-03; norm: 1.386e-01; mom: 4.483e+00;
## best it: 308; best obj: 1.480e+00
## It: 406; obj: 1.501e+00; abs: 2.549e-03; rel: 1.701e-03; norm: 1.398e-01; mom: 3.716e+00;
## best it: 308; best obj: 1.480e+00
## It: 407; obj: 1.507e+00; abs: 5.692e-03; rel: 3.792e-03; norm: 1.406e-01; mom: 4.254e+00;
## best it: 308; best obj: 1.480e+00
## It: 408; obj: 1.496e+00; abs: 1.104e-02; rel: 7.330e-03; norm: 1.395e-01; mom: 3.971e+00;
## best it: 308; best obj: 1.480e+00
## It: 409; obj: 1.499e+00; abs: 3.599e-03; rel: 2.406e-03; norm: 1.388e-01; mom: 4.026e+00;
## best it: 308; best obj: 1.480e+00

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## It: 410; obj: 1.506e+00; abs: 7.070e-03; rel: 4.716e-03; norm: 1.408e-01; mom: 4.064e+00;
## best it: 308; best obj: 1.480e+00
## It: 411; obj: 1.499e+00; abs: 7.404e-03; rel: 4.915e-03; norm: 1.408e-01; mom: 4.469e+00;
## best it: 308; best obj: 1.480e+00
## It: 412; obj: 1.484e+00; abs: 1.485e-02; rel: 9.907e-03; norm: 1.385e-01; mom: 4.153e+00;
## best it: 308; best obj: 1.480e+00
## It: 413; obj: 1.485e+00; abs: 4.679e-04; rel: 3.153e-04; norm: 1.393e-01; mom: 3.582e+00;
## best it: 308; best obj: 1.480e+00
## It: 414; obj: 1.486e+00; abs: 1.767e-03; rel: 1.190e-03; norm: 1.404e-01; mom: 3.773e+00;
## best it: 308; best obj: 1.480e+00
## It: 415; obj: 1.485e+00; abs: 1.257e-03; rel: 8.454e-04; norm: 1.394e-01; mom: 3.970e+00;
## best it: 308; best obj: 1.480e+00
## It: 416; obj: 1.494e+00; abs: 9.408e-03; rel: 6.335e-03; norm: 1.393e-01; mom: 3.831e+00;
## best it: 308; best obj: 1.480e+00
## It: 417; obj: 1.490e+00; abs: 4.573e-03; rel: 3.060e-03; norm: 1.397e-01; mom: 3.644e+00;
## best it: 308; best obj: 1.480e+00
## It: 418; obj: 1.476e+00; abs: 1.412e-02; rel: 9.477e-03; norm: 1.401e-01; mom: 4.112e+00;
## best it: 418; best obj: 1.476e+00
## It: 419; obj: 1.492e+00; abs: 1.577e-02; rel: 1.069e-02; norm: 1.393e-01; mom: 3.855e+00;
## best it: 418; best obj: 1.476e+00
## It: 420; obj: 1.497e+00; abs: 5.460e-03; rel: 3.660e-03; norm: 1.413e-01; mom: 3.478e+00;
## best it: 418; best obj: 1.476e+00
## It: 421; obj: 1.497e+00; abs: 3.364e-04; rel: 2.247e-04; norm: 1.402e-01; mom: 4.280e+00;
## best it: 418; best obj: 1.476e+00
## It: 422; obj: 1.510e+00; abs: 1.249e-02; rel: 8.342e-03; norm: 1.390e-01; mom: 4.261e+00;
## best it: 418; best obj: 1.476e+00
## It: 423; obj: 1.507e+00; abs: 3.259e-03; rel: 2.158e-03; norm: 1.407e-01; mom: 3.679e+00;
## best it: 418; best obj: 1.476e+00
## It: 424; obj: 1.483e+00; abs: 2.355e-02; rel: 1.563e-02; norm: 1.407e-01; mom: 4.496e+00;
## best it: 418; best obj: 1.476e+00
## It: 425; obj: 1.475e+00; abs: 8.463e-03; rel: 5.707e-03; norm: 1.395e-01; mom: 3.778e+00;
## best it: 425; best obj: 1.475e+00

## It: 426; obj: 1.481e+00; abs: 6.300e-03; rel: 4.273e-03; norm: 1.397e-01; mom: 3.738e+00;
## best it: 425; best obj: 1.475e+00
## It: 427; obj: 1.478e+00; abs: 3.075e-03; rel: 2.076e-03; norm: 1.390e-01; mom: 3.897e+00;
## best it: 425; best obj: 1.475e+00
## It: 428; obj: 1.494e+00; abs: 1.605e-02; rel: 1.086e-02; norm: 1.387e-01; mom: 3.894e+00;
## best it: 425; best obj: 1.475e+00
## It: 429; obj: 1.494e+00; abs: 8.686e-05; rel: 5.814e-05; norm: 1.396e-01; mom: 3.592e+00;
## best it: 425; best obj: 1.475e+00
## It: 430; obj: 1.484e+00; abs: 9.668e-03; rel: 6.472e-03; norm: 1.399e-01; mom: 4.861e+00;
## best it: 425; best obj: 1.475e+00
## It: 431; obj: 1.503e+00; abs: 1.924e-02; rel: 1.297e-02; norm: 1.396e-01; mom: 4.082e+00;
## best it: 425; best obj: 1.475e+00
## It: 432; obj: 1.493e+00; abs: 1.064e-02; rel: 7.075e-03; norm: 1.398e-01; mom: 4.284e+00;
## best it: 425; best obj: 1.475e+00
## It: 433; obj: 1.486e+00; abs: 6.715e-03; rel: 4.499e-03; norm: 1.391e-01; mom: 4.379e+00;
## best it: 425; best obj: 1.475e+00
## It: 434; obj: 1.494e+00; abs: 8.518e-03; rel: 5.732e-03; norm: 1.402e-01; mom: 4.129e+00;
## best it: 425; best obj: 1.475e+00
## It: 435; obj: 1.500e+00; abs: 5.857e-03; rel: 3.919e-03; norm: 1.396e-01; mom: 4.122e+00;
## best it: 425; best obj: 1.475e+00
## It: 436; obj: 1.508e+00; abs: 7.455e-03; rel: 4.969e-03; norm: 1.398e-01; mom: 4.495e+00;

```

```

## best it: 425; best obj: 1.475e+00
## It: 437; obj: 1.503e+00; abs: 4.883e-03; rel: 3.238e-03; norm: 1.402e-01; mom: 4.412e+00;
## best it: 425; best obj: 1.475e+00
## It: 438; obj: 1.489e+00; abs: 1.408e-02; rel: 9.371e-03; norm: 1.400e-01; mom: 4.426e+00;
## best it: 425; best obj: 1.475e+00
## It: 439; obj: 1.505e+00; abs: 1.646e-02; rel: 1.105e-02; norm: 1.398e-01; mom: 3.645e+00;
## best it: 425; best obj: 1.475e+00
## It: 440; obj: 1.496e+00; abs: 8.877e-03; rel: 5.897e-03; norm: 1.405e-01; mom: 4.606e+00;
## best it: 425; best obj: 1.475e+00
## It: 441; obj: 1.495e+00; abs: 1.846e-03; rel: 1.233e-03; norm: 1.399e-01; mom: 3.855e+00;
## best it: 425; best obj: 1.475e+00
## It: 442; obj: 1.492e+00; abs: 2.495e-03; rel: 1.669e-03; norm: 1.390e-01; mom: 3.990e+00;
## best it: 425; best obj: 1.475e+00
## It: 443; obj: 1.495e+00; abs: 2.535e-03; rel: 1.699e-03; norm: 1.385e-01; mom: 3.942e+00;
## best it: 425; best obj: 1.475e+00
## It: 444; obj: 1.498e+00; abs: 2.912e-03; rel: 1.948e-03; norm: 1.396e-01; mom: 4.394e+00;
## best it: 425; best obj: 1.475e+00
## It: 445; obj: 1.492e+00; abs: 5.314e-03; rel: 3.548e-03; norm: 1.400e-01; mom: 3.780e+00;
## best it: 425; best obj: 1.475e+00
## It: 446; obj: 1.496e+00; abs: 3.805e-03; rel: 2.550e-03; norm: 1.397e-01; mom: 4.074e+00;
## best it: 425; best obj: 1.475e+00
## It: 447; obj: 1.503e+00; abs: 7.309e-03; rel: 4.886e-03; norm: 1.392e-01; mom: 3.738e+00;
## best it: 425; best obj: 1.475e+00
## It: 448; obj: 1.502e+00; abs: 1.083e-03; rel: 7.205e-04; norm: 1.395e-01; mom: 4.331e+00;
## best it: 425; best obj: 1.475e+00
## It: 449; obj: 1.497e+00; abs: 5.385e-03; rel: 3.585e-03; norm: 1.399e-01; mom: 4.252e+00;
## best it: 425; best obj: 1.475e+00
## It: 450; obj: 1.509e+00; abs: 1.239e-02; rel: 8.275e-03; norm: 1.398e-01; mom: 4.379e+00;
## best it: 425; best obj: 1.475e+00

## It: 451; obj: 1.507e+00; abs: 2.303e-03; rel: 1.526e-03; norm: 1.404e-01; mom: 4.648e+00;
## best it: 425; best obj: 1.475e+00
## It: 452; obj: 1.494e+00; abs: 1.270e-02; rel: 8.431e-03; norm: 1.408e-01; mom: 4.718e+00;
## best it: 425; best obj: 1.475e+00
## It: 453; obj: 1.495e+00; abs: 1.147e-03; rel: 7.677e-04; norm: 1.393e-01; mom: 4.257e+00;
## best it: 425; best obj: 1.475e+00
## It: 454; obj: 1.502e+00; abs: 6.187e-03; rel: 4.137e-03; norm: 1.398e-01; mom: 4.188e+00;
## best it: 425; best obj: 1.475e+00
## It: 455; obj: 1.495e+00; abs: 6.594e-03; rel: 4.391e-03; norm: 1.395e-01; mom: 4.199e+00;
## best it: 425; best obj: 1.475e+00
## It: 456; obj: 1.493e+00; abs: 2.301e-03; rel: 1.539e-03; norm: 1.394e-01; mom: 4.436e+00;
## best it: 425; best obj: 1.475e+00
## It: 457; obj: 1.475e+00; abs: 1.789e-02; rel: 1.198e-02; norm: 1.396e-01; mom: 3.914e+00;
## best it: 425; best obj: 1.475e+00
## It: 458; obj: 1.489e+00; abs: 1.376e-02; rel: 9.328e-03; norm: 1.388e-01; mom: 4.127e+00;
## best it: 425; best obj: 1.475e+00
## It: 459; obj: 1.499e+00; abs: 1.001e-02; rel: 6.723e-03; norm: 1.383e-01; mom: 3.663e+00;
## best it: 425; best obj: 1.475e+00
## It: 460; obj: 1.469e+00; abs: 2.962e-02; rel: 1.977e-02; norm: 1.394e-01; mom: 4.341e+00;
## best it: 460; best obj: 1.469e+00
## It: 461; obj: 1.462e+00; abs: 7.301e-03; rel: 4.971e-03; norm: 1.386e-01; mom: 4.025e+00;
## best it: 461; best obj: 1.462e+00
## It: 462; obj: 1.482e+00; abs: 1.990e-02; rel: 1.362e-02; norm: 1.397e-01; mom: 3.472e+00;
## best it: 461; best obj: 1.462e+00

```

```

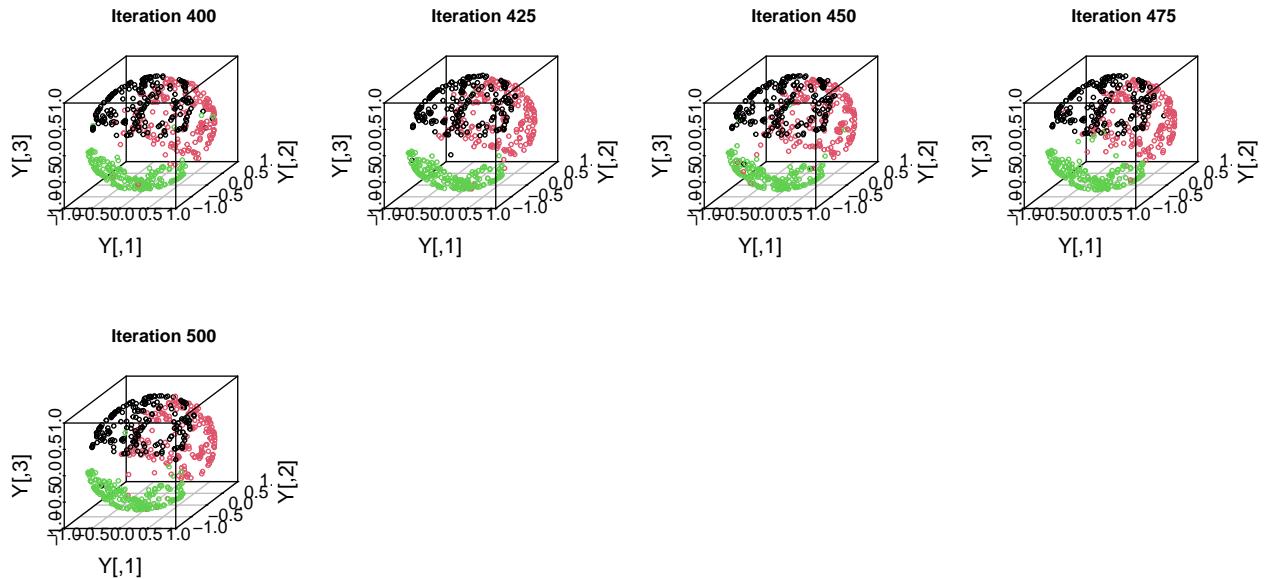
## It: 463; obj: 1.487e+00; abs: 5.163e-03; rel: 3.485e-03; norm: 1.392e-01; mom: 3.921e+00;
## best it: 461; best obj: 1.462e+00
## It: 464; obj: 1.475e+00; abs: 1.127e-02; rel: 7.578e-03; norm: 1.389e-01; mom: 3.829e+00;
## best it: 461; best obj: 1.462e+00
## It: 465; obj: 1.480e+00; abs: 5.009e-03; rel: 3.395e-03; norm: 1.401e-01; mom: 4.388e+00;
## best it: 461; best obj: 1.462e+00
## It: 466; obj: 1.493e+00; abs: 1.305e-02; rel: 8.815e-03; norm: 1.399e-01; mom: 3.776e+00;
## best it: 461; best obj: 1.462e+00
## It: 467; obj: 1.483e+00; abs: 1.041e-02; rel: 6.971e-03; norm: 1.408e-01; mom: 4.080e+00;
## best it: 461; best obj: 1.462e+00
## It: 468; obj: 1.468e+00; abs: 1.541e-02; rel: 1.039e-02; norm: 1.402e-01; mom: 4.483e+00;
## best it: 461; best obj: 1.462e+00
## It: 469; obj: 1.476e+00; abs: 8.630e-03; rel: 5.880e-03; norm: 1.389e-01; mom: 3.493e+00;
## best it: 461; best obj: 1.462e+00
## It: 470; obj: 1.490e+00; abs: 1.353e-02; rel: 9.164e-03; norm: 1.401e-01; mom: 3.486e+00;
## best it: 461; best obj: 1.462e+00
## It: 471; obj: 1.476e+00; abs: 1.397e-02; rel: 9.380e-03; norm: 1.393e-01; mom: 4.541e+00;
## best it: 461; best obj: 1.462e+00
## It: 472; obj: 1.475e+00; abs: 9.615e-04; rel: 6.515e-04; norm: 1.398e-01; mom: 3.494e+00;
## best it: 461; best obj: 1.462e+00
## It: 473; obj: 1.472e+00; abs: 3.253e-03; rel: 2.206e-03; norm: 1.404e-01; mom: 4.110e+00;
## best it: 461; best obj: 1.462e+00
## It: 474; obj: 1.475e+00; abs: 3.527e-03; rel: 2.396e-03; norm: 1.391e-01; mom: 3.439e+00;
## best it: 461; best obj: 1.462e+00
## It: 475; obj: 1.482e+00; abs: 6.788e-03; rel: 4.601e-03; norm: 1.394e-01; mom: 3.517e+00;
## best it: 461; best obj: 1.462e+00
## It: 476; obj: 1.465e+00; abs: 1.677e-02; rel: 1.132e-02; norm: 1.395e-01; mom: 4.275e+00;
## best it: 461; best obj: 1.462e+00
## It: 477; obj: 1.466e+00; abs: 7.459e-04; rel: 5.091e-04; norm: 1.394e-01; mom: 4.219e+00;
## best it: 461; best obj: 1.462e+00
## It: 478; obj: 1.475e+00; abs: 9.095e-03; rel: 6.204e-03; norm: 1.397e-01; mom: 3.037e+00;
## best it: 461; best obj: 1.462e+00
## It: 479; obj: 1.479e+00; abs: 3.828e-03; rel: 2.595e-03; norm: 1.399e-01; mom: 3.757e+00;
## best it: 461; best obj: 1.462e+00
## It: 480; obj: 1.464e+00; abs: 1.441e-02; rel: 9.743e-03; norm: 1.392e-01; mom: 3.950e+00;
## best it: 461; best obj: 1.462e+00
## It: 481; obj: 1.477e+00; abs: 1.295e-02; rel: 8.844e-03; norm: 1.388e-01; mom: 3.110e+00;
## best it: 461; best obj: 1.462e+00
## It: 482; obj: 1.487e+00; abs: 9.346e-03; rel: 6.326e-03; norm: 1.407e-01; mom: 3.665e+00;
## best it: 461; best obj: 1.462e+00
## It: 483; obj: 1.478e+00; abs: 9.183e-03; rel: 6.177e-03; norm: 1.398e-01; mom: 4.344e+00;
## best it: 461; best obj: 1.462e+00
## It: 484; obj: 1.477e+00; abs: 4.872e-04; rel: 3.298e-04; norm: 1.390e-01; mom: 3.475e+00;
## best it: 461; best obj: 1.462e+00
## It: 485; obj: 1.483e+00; abs: 6.339e-03; rel: 4.291e-03; norm: 1.405e-01; mom: 3.937e+00;
## best it: 461; best obj: 1.462e+00
## It: 486; obj: 1.476e+00; abs: 7.772e-03; rel: 5.240e-03; norm: 1.401e-01; mom: 3.966e+00;
## best it: 461; best obj: 1.462e+00
## It: 487; obj: 1.480e+00; abs: 4.599e-03; rel: 3.116e-03; norm: 1.393e-01; mom: 3.820e+00;
## best it: 461; best obj: 1.462e+00
## It: 488; obj: 1.467e+00; abs: 1.329e-02; rel: 8.978e-03; norm: 1.400e-01; mom: 3.527e+00;
## best it: 461; best obj: 1.462e+00
## It: 489; obj: 1.468e+00; abs: 1.080e-03; rel: 7.365e-04; norm: 1.392e-01; mom: 4.745e+00;

```

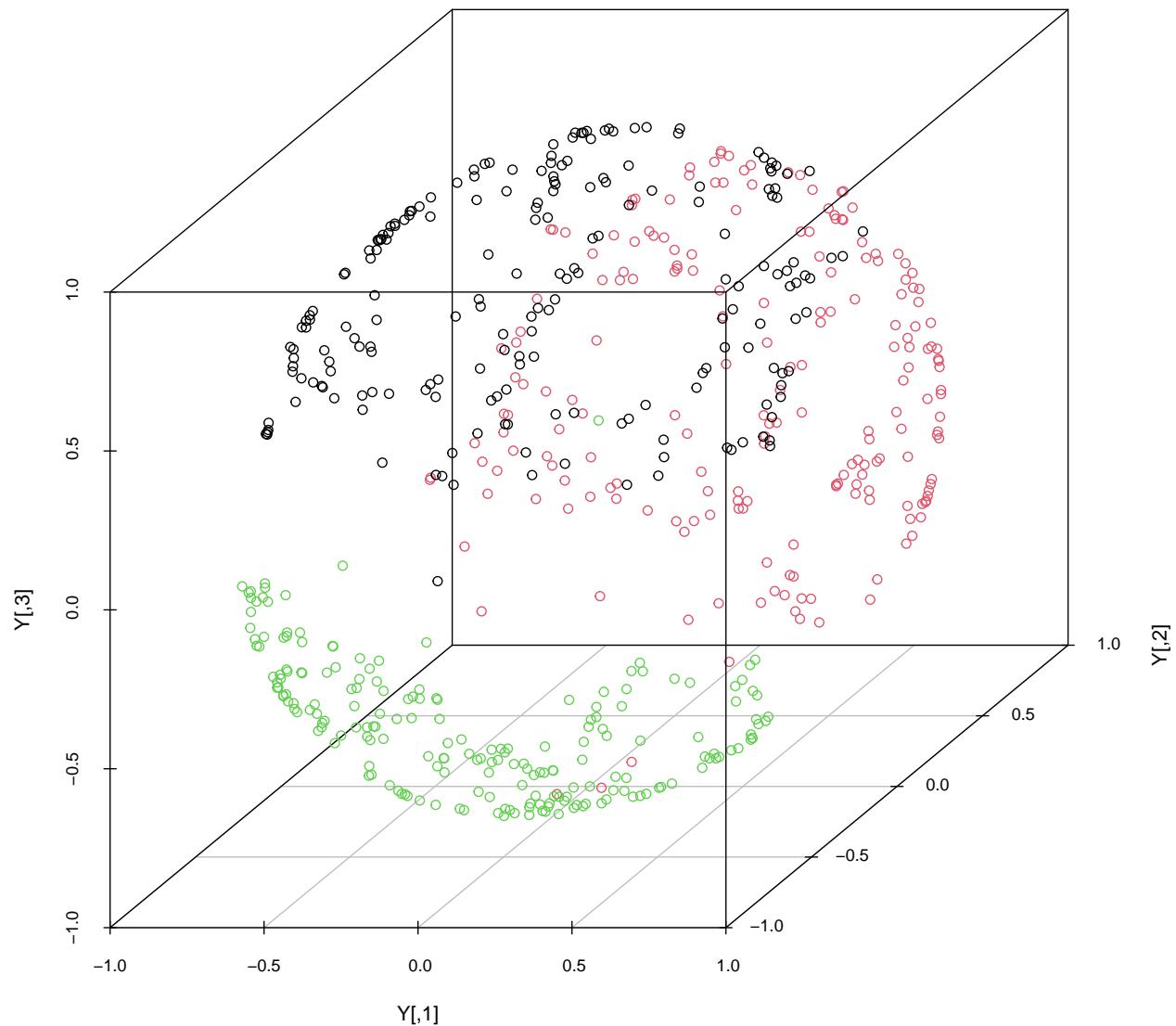
```

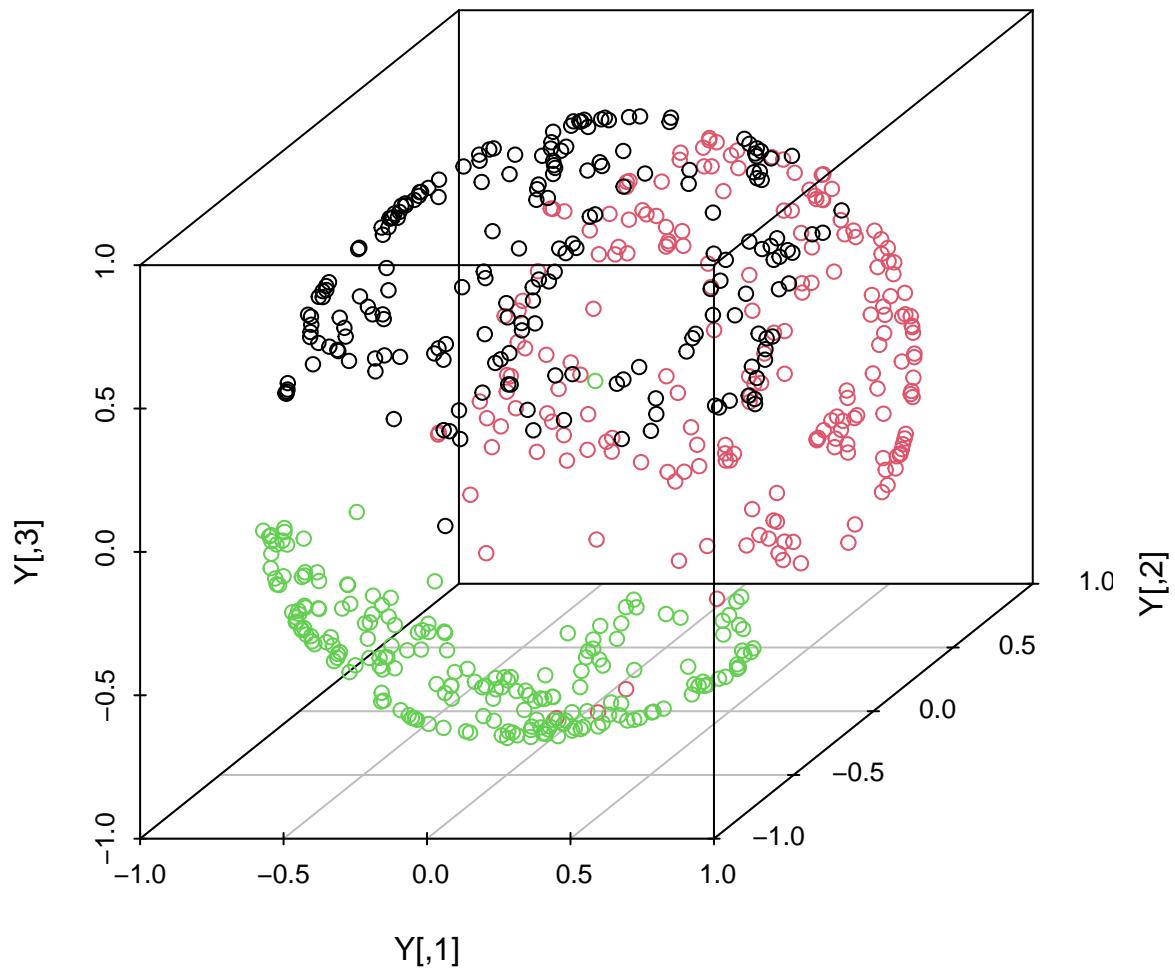
## best it: 461; best obj: 1.462e+00
## It: 490; obj: 1.486e+00; abs: 1.765e-02; rel: 1.202e-02; norm: 1.385e-01; mom: 3.001e+00;
## best it: 461; best obj: 1.462e+00
## It: 491; obj: 1.472e+00; abs: 1.353e-02; rel: 9.105e-03; norm: 1.401e-01; mom: 4.085e+00;
## best it: 461; best obj: 1.462e+00
## It: 492; obj: 1.454e+00; abs: 1.767e-02; rel: 1.200e-02; norm: 1.396e-01; mom: 4.790e+00;
## best it: 492; best obj: 1.454e+00
## It: 493; obj: 1.468e+00; abs: 1.355e-02; rel: 9.314e-03; norm: 1.398e-01; mom: 3.250e+00;
## best it: 492; best obj: 1.454e+00
## It: 494; obj: 1.479e+00; abs: 1.068e-02; rel: 7.275e-03; norm: 1.396e-01; mom: 3.600e+00;
## best it: 492; best obj: 1.454e+00
## It: 495; obj: 1.466e+00; abs: 1.285e-02; rel: 8.688e-03; norm: 1.399e-01; mom: 4.045e+00;
## best it: 492; best obj: 1.454e+00
## It: 496; obj: 1.465e+00; abs: 6.869e-04; rel: 4.686e-04; norm: 1.401e-01; mom: 3.742e+00;
## best it: 492; best obj: 1.454e+00
## It: 497; obj: 1.479e+00; abs: 1.432e-02; rel: 9.772e-03; norm: 1.391e-01; mom: 3.502e+00;
## best it: 492; best obj: 1.454e+00
## It: 498; obj: 1.483e+00; abs: 3.444e-03; rel: 2.328e-03; norm: 1.402e-01; mom: 3.858e+00;
## best it: 492; best obj: 1.454e+00
## It: 499; obj: 1.481e+00; abs: 2.266e-03; rel: 1.528e-03; norm: 1.393e-01; mom: 3.867e+00;
## best it: 492; best obj: 1.454e+00
## It: 500; obj: 1.479e+00; abs: 1.830e-03; rel: 1.236e-03; norm: 1.405e-01; mom: 3.843e+00;
## best it: 492; best obj: 1.454e+00

```



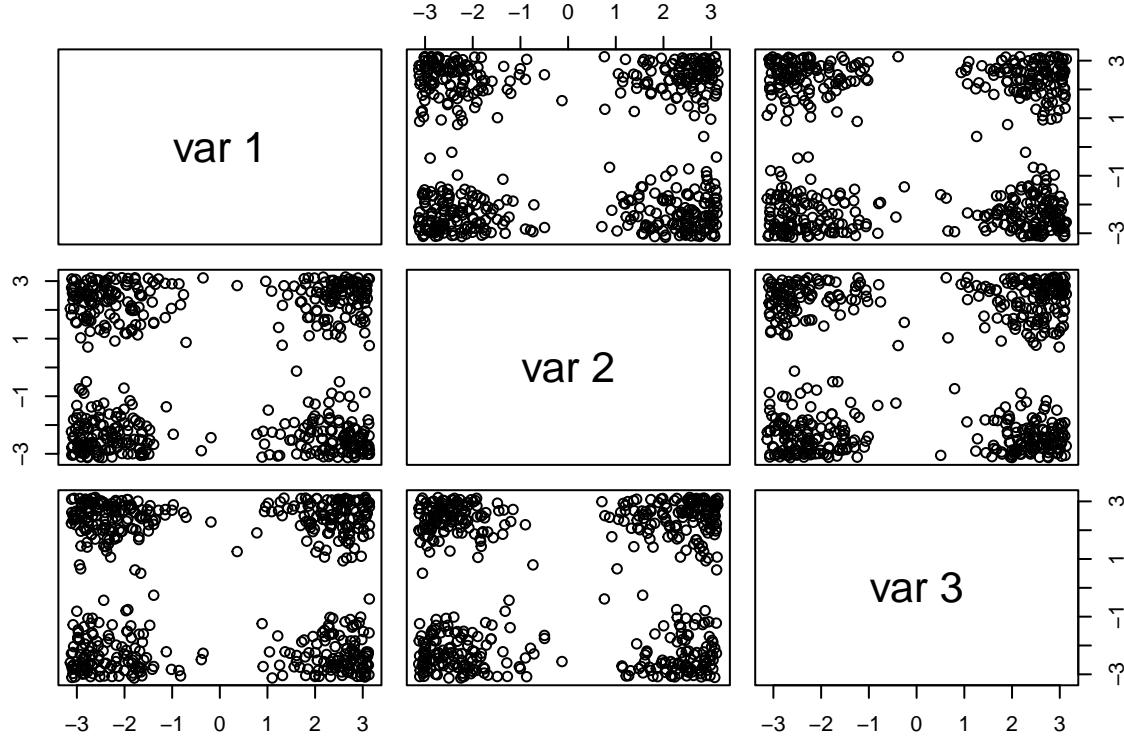
### Iteration 492



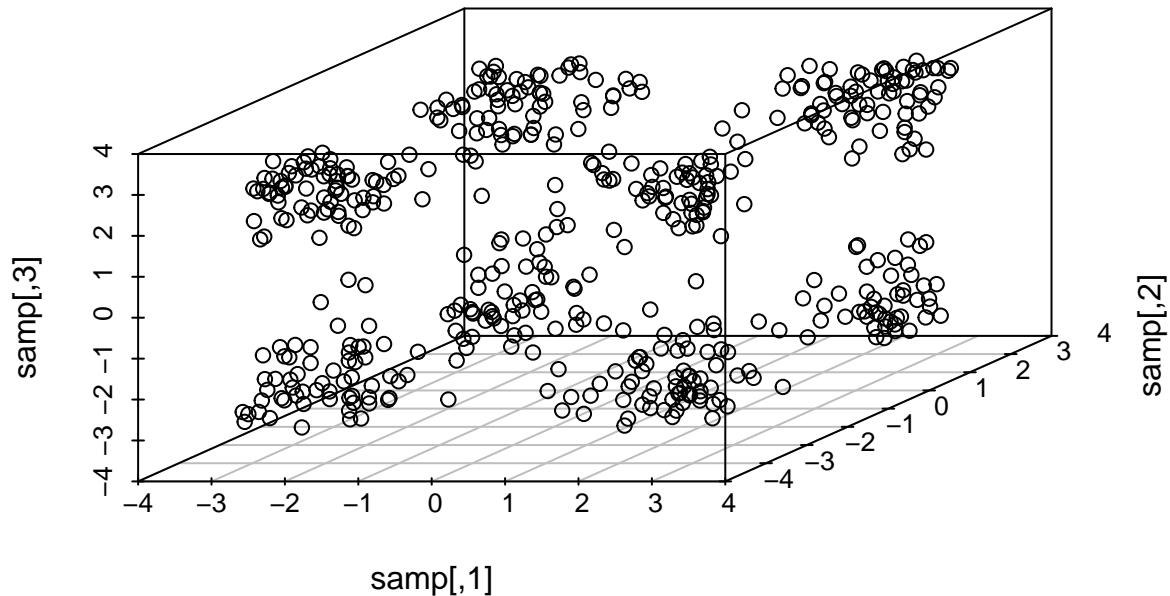


#### Case 4

```
d <- 3
n <- 5e2
samp <- sdetorus::toPiInt(mvtnorm::rmvnorm(n = n, mean = rep(pi, d)))
pairs(samp)
```



```
scatterplot3d::scatterplot3d(samp, xlim = c(-pi, pi), ylim = c(-pi, pi), zlim = c(-pi, pi))
```



```
x_4 <- array(dim = c(n, 2, 3))
x_4[, , 1] <- DirStats::to_cir(samp[, 1])
x_4[, , 2] <- DirStats::to_cir(samp[, 2])
x_4[, , 3] <- DirStats::to_cir(samp[, 3])
```

Let's calculate the rho parameters based on a perplexity of 25:

```
rho_four_perp20 <- rho_optim_bst(x_4, 20)
```

```
## Time difference of 44.09299 secs
```

First, let's reduce to dimension  $\mathbb{S}^1$  then  $d = 1$  (circumference):

```
res_pscsne <- psc_sne(X=x_4, d=1, rho_psc_list = rho_four_perp20,
                        num_iteration=500, show_prog = TRUE)

## It: 1; obj: 1.763e+01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.578e-01; mom: 0.000e+00;
## best it: 1; best obj: 1.763e+01

## It: 2; obj: 1.691e+01; abs: 7.174e-01; rel: 4.069e-02; norm: 3.205e-01; mom: 6.478e+00;
## best it: 2; best obj: 1.691e+01

## It: 3; obj: 1.662e+01; abs: 2.923e-01; rel: 1.728e-02; norm: 4.309e-01; mom: 2.970e+00;
## best it: 3; best obj: 1.662e+01

## It: 4; obj: 1.644e+01; abs: 1.794e-01; rel: 1.079e-02; norm: 4.759e-01; mom: 2.133e+00;
## best it: 4; best obj: 1.644e+01

## It: 5; obj: 1.630e+01; abs: 1.361e-01; rel: 8.277e-03; norm: 5.025e-01; mom: 1.288e+00;
## best it: 5; best obj: 1.630e+01

## It: 6; obj: 1.618e+01; abs: 1.257e-01; rel: 7.710e-03; norm: 5.239e-01; mom: 1.060e+00;
## best it: 6; best obj: 1.618e+01

## It: 7; obj: 1.606e+01; abs: 1.177e-01; rel: 7.277e-03; norm: 5.435e-01; mom: 1.008e+00;
## best it: 7; best obj: 1.606e+01

## It: 8; obj: 1.597e+01; abs: 9.221e-02; rel: 5.741e-03; norm: 5.645e-01; mom: 9.198e-01;
## best it: 8; best obj: 1.597e+01

## It: 9; obj: 1.589e+01; abs: 7.372e-02; rel: 4.616e-03; norm: 5.829e-01; mom: 8.643e-01;
## best it: 9; best obj: 1.589e+01

## It: 10; obj: 1.583e+01; abs: 6.292e-02; rel: 3.959e-03; norm: 6.002e-01; mom: 7.115e-01;
## best it: 10; best obj: 1.583e+01

## It: 11; obj: 1.578e+01; abs: 5.297e-02; rel: 3.346e-03; norm: 6.176e-01; mom: 6.478e-01;
## best it: 11; best obj: 1.578e+01

## It: 12; obj: 1.574e+01; abs: 4.085e-02; rel: 2.589e-03; norm: 6.355e-01; mom: 6.121e-01;
## best it: 12; best obj: 1.574e+01

## It: 13; obj: 1.571e+01; abs: 3.084e-02; rel: 1.959e-03; norm: 6.532e-01; mom: 5.562e-01;
## best it: 13; best obj: 1.571e+01

## It: 14; obj: 1.568e+01; abs: 2.582e-02; rel: 1.644e-03; norm: 6.699e-01; mom: 4.656e-01;
## best it: 14; best obj: 1.568e+01

## It: 15; obj: 1.566e+01; abs: 2.480e-02; rel: 1.582e-03; norm: 6.847e-01; mom: 4.206e-01;
## best it: 15; best obj: 1.566e+01

## It: 16; obj: 1.563e+01; abs: 2.488e-02; rel: 1.589e-03; norm: 6.980e-01; mom: 4.076e-01;
## best it: 16; best obj: 1.563e+01

## It: 17; obj: 1.561e+01; abs: 2.379e-02; rel: 1.522e-03; norm: 7.104e-01; mom: 3.941e-01;
## best it: 17; best obj: 1.561e+01

## It: 18; obj: 1.559e+01; abs: 2.177e-02; rel: 1.395e-03; norm: 7.221e-01; mom: 3.811e-01;
## best it: 18; best obj: 1.559e+01

## It: 19; obj: 1.557e+01; abs: 1.949e-02; rel: 1.251e-03; norm: 7.329e-01; mom: 3.681e-01;
## best it: 19; best obj: 1.557e+01

## It: 20; obj: 1.555e+01; abs: 1.695e-02; rel: 1.089e-03; norm: 7.427e-01; mom: 3.532e-01;
## best it: 20; best obj: 1.555e+01

## It: 21; obj: 1.554e+01; abs: 1.443e-02; rel: 9.282e-04; norm: 7.516e-01; mom: 3.384e-01;
## best it: 21; best obj: 1.554e+01

## It: 22; obj: 1.552e+01; abs: 1.221e-02; rel: 7.861e-04; norm: 7.598e-01; mom: 3.273e-01;
## best it: 22; best obj: 1.552e+01

## It: 23; obj: 1.551e+01; abs: 1.013e-02; rel: 6.527e-04; norm: 7.673e-01; mom: 3.184e-01;
## best it: 23; best obj: 1.551e+01

## It: 24; obj: 1.550e+01; abs: 8.383e-03; rel: 5.404e-04; norm: 7.741e-01; mom: 3.064e-01;
## best it: 24; best obj: 1.550e+01

## It: 25; obj: 1.550e+01; abs: 7.325e-03; rel: 4.724e-04; norm: 7.803e-01; mom: 2.889e-01;
```

```

## best it: 25; best obj: 1.550e+01
## It: 26; obj: 1.549e+01; abs: 6.807e-03; rel: 4.392e-04; norm: 7.858e-01; mom: 2.733e-01;
## best it: 26; best obj: 1.549e+01
## It: 27; obj: 1.548e+01; abs: 6.407e-03; rel: 4.136e-04; norm: 7.909e-01; mom: 2.652e-01;
## best it: 27; best obj: 1.548e+01
## It: 28; obj: 1.548e+01; abs: 5.873e-03; rel: 3.793e-04; norm: 7.955e-01; mom: 2.591e-01;
## best it: 28; best obj: 1.548e+01
## It: 29; obj: 1.547e+01; abs: 5.174e-03; rel: 3.343e-04; norm: 7.998e-01; mom: 2.509e-01;
## best it: 29; best obj: 1.547e+01
## It: 30; obj: 1.547e+01; abs: 4.359e-03; rel: 2.817e-04; norm: 8.036e-01; mom: 2.406e-01;
## best it: 30; best obj: 1.547e+01
## It: 31; obj: 1.547e+01; abs: 3.373e-03; rel: 2.181e-04; norm: 8.070e-01; mom: 2.287e-01;
## best it: 31; best obj: 1.547e+01
## It: 32; obj: 1.546e+01; abs: 4.065e-03; rel: 2.628e-04; norm: 8.102e-01; mom: 2.968e-01;
## best it: 32; best obj: 1.546e+01
## It: 33; obj: 1.546e+01; abs: 5.140e-03; rel: 3.325e-04; norm: 8.129e-01; mom: 3.179e-01;
## best it: 33; best obj: 1.546e+01
## It: 34; obj: 1.545e+01; abs: 3.863e-03; rel: 2.499e-04; norm: 8.151e-01; mom: 3.172e-01;
## best it: 34; best obj: 1.545e+01
## It: 35; obj: 1.545e+01; abs: 3.439e-03; rel: 2.225e-04; norm: 8.169e-01; mom: 2.368e-01;
## best it: 35; best obj: 1.545e+01
## It: 36; obj: 1.545e+01; abs: 3.233e-03; rel: 2.093e-04; norm: 8.184e-01; mom: 1.873e-01;
## best it: 36; best obj: 1.545e+01
## It: 37; obj: 1.544e+01; abs: 3.111e-03; rel: 2.014e-04; norm: 8.196e-01; mom: 1.818e-01;
## best it: 37; best obj: 1.544e+01
## It: 38; obj: 1.544e+01; abs: 3.633e-03; rel: 2.352e-04; norm: 8.205e-01; mom: 1.854e-01;
## best it: 38; best obj: 1.544e+01
## It: 39; obj: 1.543e+01; abs: 4.633e-03; rel: 3.001e-04; norm: 8.211e-01; mom: 1.710e-01;
## best it: 39; best obj: 1.543e+01
## It: 40; obj: 1.543e+01; abs: 5.534e-03; rel: 3.585e-04; norm: 8.214e-01; mom: 1.572e-01;
## best it: 40; best obj: 1.543e+01
## It: 41; obj: 1.542e+01; abs: 6.241e-03; rel: 4.045e-04; norm: 8.214e-01; mom: 1.531e-01;
## best it: 41; best obj: 1.542e+01
## It: 42; obj: 1.542e+01; abs: 6.890e-03; rel: 4.468e-04; norm: 8.213e-01; mom: 1.530e-01;
## best it: 42; best obj: 1.542e+01
## It: 43; obj: 1.541e+01; abs: 7.679e-03; rel: 4.981e-04; norm: 8.209e-01; mom: 1.558e-01;
## best it: 43; best obj: 1.541e+01
## It: 44; obj: 1.540e+01; abs: 8.991e-03; rel: 5.835e-04; norm: 8.204e-01; mom: 1.638e-01;
## best it: 44; best obj: 1.540e+01
## It: 45; obj: 1.539e+01; abs: 1.143e-02; rel: 7.420e-04; norm: 8.197e-01; mom: 1.813e-01;
## best it: 45; best obj: 1.539e+01
## It: 46; obj: 1.537e+01; abs: 1.379e-02; rel: 8.959e-04; norm: 8.189e-01; mom: 2.084e-01;
## best it: 46; best obj: 1.537e+01
## It: 47; obj: 1.536e+01; abs: 1.406e-02; rel: 9.144e-04; norm: 8.180e-01; mom: 2.146e-01;
## best it: 47; best obj: 1.536e+01
## It: 48; obj: 1.535e+01; abs: 1.327e-02; rel: 8.640e-04; norm: 8.170e-01; mom: 1.856e-01;
## best it: 48; best obj: 1.535e+01
## It: 49; obj: 1.533e+01; abs: 1.225e-02; rel: 7.985e-04; norm: 8.156e-01; mom: 1.592e-01;
## best it: 49; best obj: 1.533e+01
## It: 50; obj: 1.532e+01; abs: 1.136e-02; rel: 7.407e-04; norm: 8.141e-01; mom: 1.433e-01;
## best it: 50; best obj: 1.532e+01
## It: 51; obj: 1.531e+01; abs: 1.069e-02; rel: 6.979e-04; norm: 8.123e-01; mom: 1.332e-01;
## best it: 51; best obj: 1.531e+01

```

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## It: 52; obj: 1.530e+01; abs: 1.023e-02; rel: 6.678e-04; norm: 8.104e-01; mom: 1.221e-01;
## best it: 52; best obj: 1.530e+01
## It: 53; obj: 1.529e+01; abs: 9.864e-03; rel: 6.446e-04; norm: 8.085e-01; mom: 1.116e-01;
## best it: 53; best obj: 1.529e+01
## It: 54; obj: 1.528e+01; abs: 9.554e-03; rel: 6.247e-04; norm: 8.065e-01; mom: 1.051e-01;
## best it: 54; best obj: 1.528e+01
## It: 55; obj: 1.527e+01; abs: 9.271e-03; rel: 6.067e-04; norm: 8.045e-01; mom: 1.018e-01;
## best it: 55; best obj: 1.527e+01
## It: 56; obj: 1.526e+01; abs: 9.006e-03; rel: 5.897e-04; norm: 8.025e-01; mom: 1.001e-01;
## best it: 56; best obj: 1.526e+01
## It: 57; obj: 1.526e+01; abs: 8.749e-03; rel: 5.732e-04; norm: 8.005e-01; mom: 9.908e-02;
## best it: 57; best obj: 1.526e+01
## It: 58; obj: 1.525e+01; abs: 8.493e-03; rel: 5.567e-04; norm: 7.986e-01; mom: 9.843e-02;
## best it: 58; best obj: 1.525e+01
## It: 59; obj: 1.524e+01; abs: 8.238e-03; rel: 5.403e-04; norm: 7.966e-01; mom: 9.797e-02;
## best it: 59; best obj: 1.524e+01
## It: 60; obj: 1.523e+01; abs: 7.990e-03; rel: 5.243e-04; norm: 7.947e-01; mom: 9.770e-02;
## best it: 60; best obj: 1.523e+01
## It: 61; obj: 1.522e+01; abs: 7.760e-03; rel: 5.095e-04; norm: 7.928e-01; mom: 9.764e-02;
## best it: 61; best obj: 1.522e+01
## It: 62; obj: 1.522e+01; abs: 7.545e-03; rel: 4.956e-04; norm: 7.909e-01; mom: 9.747e-02;
## best it: 62; best obj: 1.522e+01
## It: 63; obj: 1.521e+01; abs: 7.322e-03; rel: 4.812e-04; norm: 7.890e-01; mom: 9.649e-02;
## best it: 63; best obj: 1.521e+01
## It: 64; obj: 1.520e+01; abs: 7.067e-03; rel: 4.647e-04; norm: 7.871e-01; mom: 9.411e-02;
## best it: 64; best obj: 1.520e+01
## It: 65; obj: 1.519e+01; abs: 6.774e-03; rel: 4.456e-04; norm: 7.853e-01; mom: 9.060e-02;
## best it: 65; best obj: 1.519e+01
## It: 66; obj: 1.519e+01; abs: 6.454e-03; rel: 4.248e-04; norm: 7.834e-01; mom: 8.653e-02;
## best it: 66; best obj: 1.519e+01
## It: 67; obj: 1.518e+01; abs: 6.120e-03; rel: 4.029e-04; norm: 7.817e-01; mom: 8.235e-02;
## best it: 67; best obj: 1.518e+01
## It: 68; obj: 1.518e+01; abs: 5.784e-03; rel: 3.810e-04; norm: 7.799e-01; mom: 7.833e-02;
## best it: 68; best obj: 1.518e+01
## It: 69; obj: 1.517e+01; abs: 5.455e-03; rel: 3.594e-04; norm: 7.782e-01; mom: 7.461e-02;
## best it: 69; best obj: 1.517e+01
## It: 70; obj: 1.517e+01; abs: 5.138e-03; rel: 3.387e-04; norm: 7.764e-01; mom: 7.122e-02;
## best it: 70; best obj: 1.517e+01
## It: 71; obj: 1.516e+01; abs: 4.835e-03; rel: 3.188e-04; norm: 7.748e-01; mom: 6.814e-02;
## best it: 71; best obj: 1.516e+01
## It: 72; obj: 1.516e+01; abs: 4.547e-03; rel: 2.999e-04; norm: 7.732e-01; mom: 6.533e-02;
## best it: 72; best obj: 1.516e+01
## It: 73; obj: 1.515e+01; abs: 4.274e-03; rel: 2.820e-04; norm: 7.716e-01; mom: 6.276e-02;
## best it: 73; best obj: 1.515e+01
## It: 74; obj: 1.515e+01; abs: 4.016e-03; rel: 2.650e-04; norm: 7.700e-01; mom: 6.042e-02;
## best it: 74; best obj: 1.515e+01
## It: 75; obj: 1.514e+01; abs: 3.773e-03; rel: 2.491e-04; norm: 7.685e-01; mom: 5.830e-02;
## best it: 75; best obj: 1.514e+01

## It: 76; obj: 1.514e+01; abs: 3.545e-03; rel: 2.341e-04; norm: 7.670e-01; mom: 5.640e-02;
## best it: 76; best obj: 1.514e+01
## It: 77; obj: 1.514e+01; abs: 3.332e-03; rel: 2.201e-04; norm: 7.656e-01; mom: 5.472e-02;
## best it: 77; best obj: 1.514e+01
## It: 78; obj: 1.513e+01; abs: 3.134e-03; rel: 2.071e-04; norm: 7.642e-01; mom: 5.325e-02;

```

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## best it: 78; best obj: 1.513e+01
## It: 79; obj: 1.513e+01; abs: 2.951e-03; rel: 1.950e-04; norm: 7.628e-01; mom: 5.199e-02;
## best it: 79; best obj: 1.513e+01
## It: 80; obj: 1.513e+01; abs: 2.781e-03; rel: 1.838e-04; norm: 7.615e-01; mom: 5.093e-02;
## best it: 80; best obj: 1.513e+01
## It: 81; obj: 1.513e+01; abs: 2.624e-03; rel: 1.735e-04; norm: 7.602e-01; mom: 5.007e-02;
## best it: 81; best obj: 1.513e+01
## It: 82; obj: 1.512e+01; abs: 2.481e-03; rel: 1.640e-04; norm: 7.589e-01; mom: 4.940e-02;
## best it: 82; best obj: 1.512e+01
## It: 83; obj: 1.512e+01; abs: 2.350e-03; rel: 1.554e-04; norm: 7.577e-01; mom: 4.894e-02;
## best it: 83; best obj: 1.512e+01
## It: 84; obj: 1.512e+01; abs: 2.233e-03; rel: 1.476e-04; norm: 7.565e-01; mom: 4.869e-02;
## best it: 84; best obj: 1.512e+01
## It: 85; obj: 1.512e+01; abs: 2.127e-03; rel: 1.407e-04; norm: 7.553e-01; mom: 4.867e-02;
## best it: 85; best obj: 1.512e+01
## It: 86; obj: 1.511e+01; abs: 2.034e-03; rel: 1.346e-04; norm: 7.541e-01; mom: 4.891e-02;
## best it: 86; best obj: 1.511e+01
## It: 87; obj: 1.511e+01; abs: 1.953e-03; rel: 1.292e-04; norm: 7.529e-01; mom: 4.947e-02;
## best it: 87; best obj: 1.511e+01
## It: 88; obj: 1.511e+01; abs: 1.880e-03; rel: 1.244e-04; norm: 7.518e-01; mom: 5.039e-02;
## best it: 88; best obj: 1.511e+01
## It: 89; obj: 1.511e+01; abs: 1.810e-03; rel: 1.198e-04; norm: 7.507e-01; mom: 5.170e-02;
## best it: 89; best obj: 1.511e+01
## It: 90; obj: 1.511e+01; abs: 1.731e-03; rel: 1.146e-04; norm: 7.496e-01; mom: 5.332e-02;
## best it: 90; best obj: 1.511e+01
## It: 91; obj: 1.511e+01; abs: 1.628e-03; rel: 1.078e-04; norm: 7.486e-01; mom: 5.493e-02;
## best it: 91; best obj: 1.511e+01
## It: 92; obj: 1.510e+01; abs: 1.490e-03; rel: 9.862e-05; norm: 7.476e-01; mom: 5.595e-02;
## best it: 92; best obj: 1.510e+01
## It: 93; obj: 1.510e+01; abs: 1.316e-03; rel: 8.714e-05; norm: 7.466e-01; mom: 5.572e-02;
## best it: 93; best obj: 1.510e+01
## It: 94; obj: 1.510e+01; abs: 1.125e-03; rel: 7.451e-05; norm: 7.457e-01; mom: 5.396e-02;
## best it: 94; best obj: 1.510e+01
## It: 95; obj: 1.510e+01; abs: 9.371e-04; rel: 6.205e-05; norm: 7.449e-01; mom: 5.107e-02;
## best it: 95; best obj: 1.510e+01
## It: 96; obj: 1.510e+01; abs: 7.612e-04; rel: 5.041e-05; norm: 7.442e-01; mom: 4.788e-02;
## best it: 96; best obj: 1.510e+01
## It: 97; obj: 1.510e+01; abs: 5.984e-04; rel: 3.963e-05; norm: 7.435e-01; mom: 4.497e-02;
## best it: 97; best obj: 1.510e+01
## It: 98; obj: 1.510e+01; abs: 4.471e-04; rel: 2.961e-05; norm: 7.429e-01; mom: 4.288e-02;
## best it: 98; best obj: 1.510e+01
## It: 99; obj: 1.510e+01; abs: 3.064e-04; rel: 2.030e-05; norm: 7.423e-01; mom: 4.215e-02;
## best it: 99; best obj: 1.510e+01
## It: 100; obj: 1.510e+01; abs: 1.767e-04; rel: 1.170e-05; norm: 7.417e-01; mom: 4.178e-02;
## best it: 100; best obj: 1.510e+01

## It: 101; obj: 2.382e+00; abs: 1.272e+01; rel: 8.423e-01; norm: 9.661e-02; mom: 4.159e-02;
## best it: 101; best obj: 2.382e+00
## It: 102; obj: 2.378e+00; abs: 3.597e-03; rel: 1.510e-03; norm: 9.352e-02; mom: 2.150e+00;
## best it: 102; best obj: 2.378e+00
## It: 103; obj: 2.372e+00; abs: 5.661e-03; rel: 2.380e-03; norm: 9.374e-02; mom: 5.849e-01;
## best it: 103; best obj: 2.372e+00
## It: 104; obj: 2.371e+00; abs: 1.545e-03; rel: 6.511e-04; norm: 9.496e-02; mom: 1.721e+00;
## best it: 104; best obj: 2.371e+00

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## It: 105; obj: 2.371e+00; abs: 2.623e-04; rel: 1.106e-04; norm: 9.488e-02; mom: 5.356e-01;
## best it: 104; best obj: 2.371e+00
## It: 106; obj: 2.371e+00; abs: 2.447e-04; rel: 1.032e-04; norm: 9.489e-02; mom: 1.195e+00;
## best it: 104; best obj: 2.371e+00
## It: 107; obj: 2.370e+00; abs: 1.640e-03; rel: 6.917e-04; norm: 9.507e-02; mom: 6.977e-01;
## best it: 107; best obj: 2.370e+00
## It: 108; obj: 2.369e+00; abs: 6.561e-04; rel: 2.769e-04; norm: 9.543e-02; mom: 1.170e+00;
## best it: 108; best obj: 2.369e+00
## It: 109; obj: 2.370e+00; abs: 5.849e-04; rel: 2.469e-04; norm: 9.575e-02; mom: 7.591e-01;
## best it: 108; best obj: 2.369e+00
## It: 110; obj: 2.370e+00; abs: 7.247e-04; rel: 3.058e-04; norm: 9.551e-02; mom: 1.256e+00;
## best it: 108; best obj: 2.369e+00
## It: 111; obj: 2.370e+00; abs: 4.441e-05; rel: 1.874e-05; norm: 9.565e-02; mom: 6.649e-01;
## best it: 108; best obj: 2.369e+00
## It: 112; obj: 2.370e+00; abs: 6.426e-05; rel: 2.711e-05; norm: 9.587e-02; mom: 1.338e+00;
## best it: 108; best obj: 2.369e+00
## It: 113; obj: 2.371e+00; abs: 5.572e-04; rel: 2.351e-04; norm: 9.560e-02; mom: 1.048e+00;
## best it: 108; best obj: 2.369e+00
## It: 114; obj: 2.371e+00; abs: 2.389e-04; rel: 1.008e-04; norm: 9.568e-02; mom: 1.444e+00;
## best it: 108; best obj: 2.369e+00
## It: 115; obj: 2.368e+00; abs: 2.200e-03; rel: 9.279e-04; norm: 9.551e-02; mom: 9.802e-01;
## best it: 115; best obj: 2.368e+00
## It: 116; obj: 2.367e+00; abs: 1.211e-03; rel: 5.113e-04; norm: 9.561e-02; mom: 1.195e+00;
## best it: 116; best obj: 2.367e+00
## It: 117; obj: 2.369e+00; abs: 1.600e-03; rel: 6.760e-04; norm: 9.580e-02; mom: 6.906e-01;
## best it: 116; best obj: 2.367e+00
## It: 118; obj: 2.370e+00; abs: 9.252e-04; rel: 3.906e-04; norm: 9.596e-02; mom: 1.006e+00;
## best it: 116; best obj: 2.367e+00
## It: 119; obj: 2.369e+00; abs: 4.437e-04; rel: 1.873e-04; norm: 9.595e-02; mom: 7.492e-01;
## best it: 116; best obj: 2.367e+00
## It: 120; obj: 2.369e+00; abs: 1.845e-04; rel: 7.788e-05; norm: 9.614e-02; mom: 1.168e+00;
## best it: 116; best obj: 2.367e+00
## It: 121; obj: 2.371e+00; abs: 1.344e-03; rel: 5.673e-04; norm: 9.591e-02; mom: 9.429e-01;
## best it: 116; best obj: 2.367e+00
## It: 122; obj: 2.369e+00; abs: 1.868e-03; rel: 7.879e-04; norm: 9.586e-02; mom: 8.965e-01;
## best it: 116; best obj: 2.367e+00
## It: 123; obj: 2.368e+00; abs: 4.597e-04; rel: 1.940e-04; norm: 9.581e-02; mom: 1.368e+00;
## best it: 116; best obj: 2.367e+00
## It: 124; obj: 2.369e+00; abs: 8.824e-04; rel: 3.726e-04; norm: 9.590e-02; mom: 1.056e+00;
## best it: 116; best obj: 2.367e+00
## It: 125; obj: 2.369e+00; abs: 8.733e-05; rel: 3.686e-05; norm: 9.607e-02; mom: 8.212e-01;
## best it: 116; best obj: 2.367e+00
## It: 126; obj: 2.368e+00; abs: 1.560e-03; rel: 6.586e-04; norm: 9.610e-02; mom: 8.515e-01;
## best it: 116; best obj: 2.367e+00
## It: 127; obj: 2.368e+00; abs: 2.573e-04; rel: 1.087e-04; norm: 9.622e-02; mom: 1.196e+00;
## best it: 116; best obj: 2.367e+00
## It: 128; obj: 2.369e+00; abs: 3.830e-04; rel: 1.617e-04; norm: 9.626e-02; mom: 1.109e+00;
## best it: 116; best obj: 2.367e+00
## It: 129; obj: 2.369e+00; abs: 5.703e-04; rel: 2.408e-04; norm: 9.606e-02; mom: 8.001e-01;
## best it: 116; best obj: 2.367e+00
## It: 130; obj: 2.368e+00; abs: 9.077e-04; rel: 3.832e-04; norm: 9.583e-02; mom: 1.296e+00;
## best it: 116; best obj: 2.367e+00
## It: 131; obj: 2.367e+00; abs: 1.302e-03; rel: 5.499e-04; norm: 9.616e-02; mom: 8.011e-01;

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## best it: 131; best obj: 2.367e+00
## It: 132; obj: 2.367e+00; abs: 2.841e-04; rel: 1.200e-04; norm: 9.635e-02; mom: 1.017e+00;
## best it: 132; best obj: 2.367e+00
## It: 133; obj: 2.367e+00; abs: 8.153e-04; rel: 3.445e-04; norm: 9.611e-02; mom: 1.003e+00;
## best it: 132; best obj: 2.367e+00
## It: 134; obj: 2.369e+00; abs: 2.010e-03; rel: 8.491e-04; norm: 9.627e-02; mom: 6.907e-01;
## best it: 132; best obj: 2.367e+00
## It: 135; obj: 2.370e+00; abs: 4.695e-04; rel: 1.982e-04; norm: 9.595e-02; mom: 8.976e-01;
## best it: 132; best obj: 2.367e+00
## It: 136; obj: 2.368e+00; abs: 1.600e-03; rel: 6.751e-04; norm: 9.613e-02; mom: 1.136e+00;
## best it: 132; best obj: 2.367e+00
## It: 137; obj: 2.366e+00; abs: 1.912e-03; rel: 8.073e-04; norm: 9.639e-02; mom: 8.669e-01;
## best it: 137; best obj: 2.366e+00
## It: 138; obj: 2.368e+00; abs: 1.392e-03; rel: 5.881e-04; norm: 9.619e-02; mom: 1.393e+00;
## best it: 137; best obj: 2.366e+00
## It: 139; obj: 2.369e+00; abs: 1.571e-03; rel: 6.633e-04; norm: 9.630e-02; mom: 8.438e-01;
## best it: 137; best obj: 2.366e+00
## It: 140; obj: 2.368e+00; abs: 1.802e-03; rel: 7.607e-04; norm: 9.617e-02; mom: 8.259e-01;
## best it: 137; best obj: 2.366e+00
## It: 141; obj: 2.368e+00; abs: 4.022e-04; rel: 1.699e-04; norm: 9.642e-02; mom: 1.490e+00;
## best it: 137; best obj: 2.366e+00
## It: 142; obj: 2.366e+00; abs: 2.250e-03; rel: 9.501e-04; norm: 9.659e-02; mom: 8.286e-01;
## best it: 142; best obj: 2.366e+00
## It: 143; obj: 2.366e+00; abs: 1.406e-04; rel: 5.943e-05; norm: 9.623e-02; mom: 1.299e+00;
## best it: 142; best obj: 2.366e+00
## It: 144; obj: 2.367e+00; abs: 1.105e-03; rel: 4.671e-04; norm: 9.644e-02; mom: 6.482e-01;
## best it: 142; best obj: 2.366e+00
## It: 145; obj: 2.367e+00; abs: 9.125e-05; rel: 3.855e-05; norm: 9.632e-02; mom: 8.786e-01;
## best it: 142; best obj: 2.366e+00
## It: 146; obj: 2.367e+00; abs: 3.113e-04; rel: 1.315e-04; norm: 9.612e-02; mom: 1.326e+00;
## best it: 142; best obj: 2.366e+00
## It: 147; obj: 2.367e+00; abs: 1.741e-04; rel: 7.356e-05; norm: 9.648e-02; mom: 8.074e-01;
## best it: 142; best obj: 2.366e+00
## It: 148; obj: 2.366e+00; abs: 8.753e-04; rel: 3.698e-04; norm: 9.629e-02; mom: 8.959e-01;
## best it: 142; best obj: 2.366e+00
## It: 149; obj: 2.367e+00; abs: 9.753e-04; rel: 4.122e-04; norm: 9.621e-02; mom: 1.148e+00;
## best it: 142; best obj: 2.366e+00
## It: 150; obj: 2.367e+00; abs: 2.080e-04; rel: 8.786e-05; norm: 9.631e-02; mom: 7.834e-01;
## best it: 142; best obj: 2.366e+00

## It: 151; obj: 2.367e+00; abs: 4.799e-05; rel: 2.027e-05; norm: 9.618e-02; mom: 9.849e-01;
## best it: 142; best obj: 2.366e+00
## It: 152; obj: 2.366e+00; abs: 1.544e-03; rel: 6.521e-04; norm: 9.634e-02; mom: 7.088e-01;
## best it: 142; best obj: 2.366e+00
## It: 153; obj: 2.366e+00; abs: 7.157e-04; rel: 3.025e-04; norm: 9.618e-02; mom: 1.174e+00;
## best it: 142; best obj: 2.366e+00
## It: 154; obj: 2.368e+00; abs: 1.402e-03; rel: 5.923e-04; norm: 9.645e-02; mom: 8.554e-01;
## best it: 142; best obj: 2.366e+00
## It: 155; obj: 2.367e+00; abs: 7.565e-04; rel: 3.195e-04; norm: 9.648e-02; mom: 8.742e-01;
## best it: 142; best obj: 2.366e+00
## It: 156; obj: 2.366e+00; abs: 1.299e-03; rel: 5.488e-04; norm: 9.593e-02; mom: 1.198e+00;
## best it: 142; best obj: 2.366e+00
## It: 157; obj: 2.365e+00; abs: 8.186e-04; rel: 3.460e-04; norm: 9.632e-02; mom: 8.484e-01;
## best it: 157; best obj: 2.365e+00

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## It: 158; obj: 2.365e+00; abs: 4.593e-04; rel: 1.942e-04; norm: 9.635e-02; mom: 8.847e-01;
## best it: 157; best obj: 2.365e+00
## It: 159; obj: 2.366e+00; abs: 5.273e-04; rel: 2.229e-04; norm: 9.624e-02; mom: 7.236e-01;
## best it: 157; best obj: 2.365e+00
## It: 160; obj: 2.368e+00; abs: 2.069e-03; rel: 8.743e-04; norm: 9.639e-02; mom: 8.451e-01;
## best it: 157; best obj: 2.365e+00
## It: 161; obj: 2.369e+00; abs: 1.452e-03; rel: 6.130e-04; norm: 9.626e-02; mom: 9.143e-01;
## best it: 157; best obj: 2.365e+00
## It: 162; obj: 2.367e+00; abs: 2.120e-03; rel: 8.949e-04; norm: 9.631e-02; mom: 1.103e+00;
## best it: 157; best obj: 2.365e+00
## It: 163; obj: 2.365e+00; abs: 1.908e-03; rel: 8.059e-04; norm: 9.623e-02; mom: 1.277e+00;
## best it: 157; best obj: 2.365e+00
## It: 164; obj: 2.366e+00; abs: 4.262e-04; rel: 1.802e-04; norm: 9.619e-02; mom: 1.163e+00;
## best it: 157; best obj: 2.365e+00
## It: 165; obj: 2.367e+00; abs: 1.244e-03; rel: 5.259e-04; norm: 9.646e-02; mom: 6.821e-01;
## best it: 157; best obj: 2.365e+00
## It: 166; obj: 2.367e+00; abs: 4.102e-04; rel: 1.733e-04; norm: 9.620e-02; mom: 7.391e-01;
## best it: 157; best obj: 2.365e+00
## It: 167; obj: 2.367e+00; abs: 7.576e-05; rel: 3.201e-05; norm: 9.613e-02; mom: 1.156e+00;
## best it: 157; best obj: 2.365e+00
## It: 168; obj: 2.367e+00; abs: 1.916e-04; rel: 8.097e-05; norm: 9.636e-02; mom: 8.368e-01;
## best it: 157; best obj: 2.365e+00
## It: 169; obj: 2.366e+00; abs: 7.682e-04; rel: 3.246e-04; norm: 9.635e-02; mom: 1.052e+00;
## best it: 157; best obj: 2.365e+00
## It: 170; obj: 2.367e+00; abs: 7.064e-04; rel: 2.986e-04; norm: 9.633e-02; mom: 1.132e+00;
## best it: 157; best obj: 2.365e+00
## It: 171; obj: 2.366e+00; abs: 1.898e-04; rel: 8.022e-05; norm: 9.621e-02; mom: 1.116e+00;
## best it: 157; best obj: 2.365e+00
## It: 172; obj: 2.366e+00; abs: 1.527e-04; rel: 6.452e-05; norm: 9.615e-02; mom: 1.039e+00;
## best it: 157; best obj: 2.365e+00
## It: 173; obj: 2.367e+00; abs: 2.156e-04; rel: 9.110e-05; norm: 9.643e-02; mom: 8.117e-01;
## best it: 157; best obj: 2.365e+00
## It: 174; obj: 2.366e+00; abs: 9.286e-04; rel: 3.923e-04; norm: 9.635e-02; mom: 9.367e-01;
## best it: 157; best obj: 2.365e+00
## It: 175; obj: 2.368e+00; abs: 1.852e-03; rel: 7.830e-04; norm: 9.648e-02; mom: 1.166e+00;
## best it: 157; best obj: 2.365e+00

## It: 176; obj: 2.367e+00; abs: 1.066e-03; rel: 4.502e-04; norm: 9.637e-02; mom: 8.590e-01;
## best it: 157; best obj: 2.365e+00
## It: 177; obj: 2.365e+00; abs: 1.114e-03; rel: 4.706e-04; norm: 9.606e-02; mom: 1.240e+00;
## best it: 157; best obj: 2.365e+00
## It: 178; obj: 2.365e+00; abs: 6.861e-04; rel: 2.901e-04; norm: 9.645e-02; mom: 7.927e-01;
## best it: 178; best obj: 2.365e+00
## It: 179; obj: 2.365e+00; abs: 2.299e-04; rel: 9.721e-05; norm: 9.639e-02; mom: 8.675e-01;
## best it: 178; best obj: 2.365e+00
## It: 180; obj: 2.366e+00; abs: 1.249e-03; rel: 5.282e-04; norm: 9.639e-02; mom: 6.987e-01;
## best it: 178; best obj: 2.365e+00
## It: 181; obj: 2.368e+00; abs: 1.328e-03; rel: 5.613e-04; norm: 9.637e-02; mom: 8.018e-01;
## best it: 178; best obj: 2.365e+00
## It: 182; obj: 2.369e+00; abs: 1.515e-03; rel: 6.397e-04; norm: 9.620e-02; mom: 8.523e-01;
## best it: 178; best obj: 2.365e+00
## It: 183; obj: 2.366e+00; abs: 3.218e-03; rel: 1.358e-03; norm: 9.640e-02; mom: 1.277e+00;
## best it: 178; best obj: 2.365e+00
## It: 184; obj: 2.365e+00; abs: 6.873e-04; rel: 2.905e-04; norm: 9.635e-02; mom: 1.178e+00;

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## best it: 178; best obj: 2.365e+00
## It: 185; obj: 2.366e+00; abs: 4.985e-04; rel: 2.108e-04; norm: 9.636e-02; mom: 1.005e+00;
## best it: 178; best obj: 2.365e+00
## It: 186; obj: 2.367e+00; abs: 1.178e-03; rel: 4.978e-04; norm: 9.655e-02; mom: 7.519e-01;
## best it: 178; best obj: 2.365e+00
## It: 187; obj: 2.368e+00; abs: 9.231e-04; rel: 3.900e-04; norm: 9.623e-02; mom: 8.347e-01;
## best it: 178; best obj: 2.365e+00
## It: 188; obj: 2.366e+00; abs: 1.925e-03; rel: 8.130e-04; norm: 9.626e-02; mom: 9.282e-01;
## best it: 178; best obj: 2.365e+00
## It: 189; obj: 2.367e+00; abs: 9.482e-04; rel: 4.008e-04; norm: 9.637e-02; mom: 1.220e+00;
## best it: 178; best obj: 2.365e+00
## It: 190; obj: 2.366e+00; abs: 9.136e-04; rel: 3.860e-04; norm: 9.635e-02; mom: 6.238e-01;
## best it: 178; best obj: 2.365e+00
## It: 191; obj: 2.366e+00; abs: 1.808e-05; rel: 7.641e-06; norm: 9.633e-02; mom: 1.109e+00;
## best it: 178; best obj: 2.365e+00
## It: 192; obj: 2.367e+00; abs: 6.744e-04; rel: 2.850e-04; norm: 9.619e-02; mom: 7.277e-01;
## best it: 178; best obj: 2.365e+00
## It: 193; obj: 2.365e+00; abs: 1.146e-03; rel: 4.841e-04; norm: 9.636e-02; mom: 8.423e-01;
## best it: 178; best obj: 2.365e+00
## It: 194; obj: 2.365e+00; abs: 3.411e-04; rel: 1.442e-04; norm: 9.632e-02; mom: 1.017e+00;
## best it: 178; best obj: 2.365e+00
## It: 195; obj: 2.366e+00; abs: 8.853e-04; rel: 3.743e-04; norm: 9.625e-02; mom: 1.032e+00;
## best it: 178; best obj: 2.365e+00
## It: 196; obj: 2.368e+00; abs: 1.619e-03; rel: 6.843e-04; norm: 9.643e-02; mom: 7.894e-01;
## best it: 178; best obj: 2.365e+00
## It: 197; obj: 2.366e+00; abs: 1.131e-03; rel: 4.778e-04; norm: 9.635e-02; mom: 8.312e-01;
## best it: 178; best obj: 2.365e+00
## It: 198; obj: 2.365e+00; abs: 1.115e-03; rel: 4.710e-04; norm: 9.626e-02; mom: 1.246e+00;
## best it: 178; best obj: 2.365e+00
## It: 199; obj: 2.365e+00; abs: 3.510e-04; rel: 1.484e-04; norm: 9.652e-02; mom: 9.151e-01;
## best it: 178; best obj: 2.365e+00
## It: 200; obj: 2.366e+00; abs: 1.067e-03; rel: 4.511e-04; norm: 9.636e-02; mom: 8.210e-01;
## best it: 178; best obj: 2.365e+00

## It: 201; obj: 2.367e+00; abs: 1.355e-03; rel: 5.725e-04; norm: 9.642e-02; mom: 8.449e-01;
## best it: 178; best obj: 2.365e+00
## It: 202; obj: 2.368e+00; abs: 4.251e-04; rel: 1.796e-04; norm: 9.630e-02; mom: 8.123e-01;
## best it: 178; best obj: 2.365e+00
## It: 203; obj: 2.367e+00; abs: 6.240e-04; rel: 2.635e-04; norm: 9.640e-02; mom: 1.445e+00;
## best it: 178; best obj: 2.365e+00
## It: 204; obj: 2.364e+00; abs: 2.826e-03; rel: 1.194e-03; norm: 9.646e-02; mom: 7.632e-01;
## best it: 204; best obj: 2.364e+00
## It: 205; obj: 2.365e+00; abs: 3.686e-04; rel: 1.559e-04; norm: 9.641e-02; mom: 1.256e+00;
## best it: 204; best obj: 2.364e+00
## It: 206; obj: 2.365e+00; abs: 6.171e-04; rel: 2.610e-04; norm: 9.640e-02; mom: 5.936e-01;
## best it: 204; best obj: 2.364e+00
## It: 207; obj: 2.366e+00; abs: 2.920e-04; rel: 1.234e-04; norm: 9.649e-02; mom: 7.662e-01;
## best it: 204; best obj: 2.364e+00
## It: 208; obj: 2.366e+00; abs: 4.754e-04; rel: 2.010e-04; norm: 9.648e-02; mom: 7.697e-01;
## best it: 204; best obj: 2.364e+00
## It: 209; obj: 2.365e+00; abs: 1.270e-03; rel: 5.368e-04; norm: 9.639e-02; mom: 7.434e-01;
## best it: 204; best obj: 2.364e+00
## It: 210; obj: 2.365e+00; abs: 1.416e-04; rel: 5.986e-05; norm: 9.641e-02; mom: 9.664e-01;
## best it: 204; best obj: 2.364e+00

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## It: 211; obj: 2.365e+00; abs: 5.744e-04; rel: 2.429e-04; norm: 9.649e-02; mom: 5.685e-01;
## best it: 204; best obj: 2.364e+00
## It: 212; obj: 2.366e+00; abs: 8.049e-04; rel: 3.403e-04; norm: 9.645e-02; mom: 7.446e-01;
## best it: 204; best obj: 2.364e+00
## It: 213; obj: 2.367e+00; abs: 1.088e-03; rel: 4.598e-04; norm: 9.637e-02; mom: 7.650e-01;
## best it: 204; best obj: 2.364e+00
## It: 214; obj: 2.367e+00; abs: 3.698e-04; rel: 1.562e-04; norm: 9.619e-02; mom: 8.911e-01;
## best it: 204; best obj: 2.364e+00
## It: 215; obj: 2.368e+00; abs: 1.097e-03; rel: 4.635e-04; norm: 9.647e-02; mom: 1.434e+00;
## best it: 204; best obj: 2.364e+00
## It: 216; obj: 2.366e+00; abs: 2.352e-03; rel: 9.931e-04; norm: 9.655e-02; mom: 7.236e-01;
## best it: 204; best obj: 2.364e+00
## It: 217; obj: 2.365e+00; abs: 1.305e-04; rel: 5.518e-05; norm: 9.635e-02; mom: 1.496e+00;
## best it: 204; best obj: 2.364e+00
## It: 218; obj: 2.366e+00; abs: 1.004e-03; rel: 4.246e-04; norm: 9.644e-02; mom: 6.535e-01;
## best it: 204; best obj: 2.364e+00
## It: 219; obj: 2.366e+00; abs: 7.049e-04; rel: 2.979e-04; norm: 9.637e-02; mom: 9.545e-01;
## best it: 204; best obj: 2.364e+00
## It: 220; obj: 2.366e+00; abs: 8.314e-05; rel: 3.514e-05; norm: 9.625e-02; mom: 1.073e+00;
## best it: 204; best obj: 2.364e+00
## It: 221; obj: 2.367e+00; abs: 1.369e-03; rel: 5.785e-04; norm: 9.656e-02; mom: 1.124e+00;
## best it: 204; best obj: 2.364e+00
## It: 222; obj: 2.366e+00; abs: 1.348e-03; rel: 5.694e-04; norm: 9.643e-02; mom: 7.127e-01;
## best it: 204; best obj: 2.364e+00
## It: 223; obj: 2.366e+00; abs: 6.513e-04; rel: 2.753e-04; norm: 9.627e-02; mom: 1.222e+00;
## best it: 204; best obj: 2.364e+00
## It: 224; obj: 2.365e+00; abs: 1.273e-03; rel: 5.381e-04; norm: 9.635e-02; mom: 7.286e-01;
## best it: 204; best obj: 2.364e+00
## It: 225; obj: 2.365e+00; abs: 2.602e-04; rel: 1.100e-04; norm: 9.641e-02; mom: 1.169e+00;
## best it: 204; best obj: 2.364e+00

## It: 226; obj: 2.366e+00; abs: 9.527e-04; rel: 4.027e-04; norm: 9.641e-02; mom: 5.372e-01;
## best it: 204; best obj: 2.364e+00
## It: 227; obj: 2.367e+00; abs: 5.821e-04; rel: 2.460e-04; norm: 9.617e-02; mom: 1.221e+00;
## best it: 204; best obj: 2.364e+00
## It: 228; obj: 2.368e+00; abs: 1.421e-03; rel: 6.001e-04; norm: 9.635e-02; mom: 1.213e+00;
## best it: 204; best obj: 2.364e+00
## It: 229; obj: 2.366e+00; abs: 2.022e-03; rel: 8.539e-04; norm: 9.654e-02; mom: 7.764e-01;
## best it: 204; best obj: 2.364e+00
## It: 230; obj: 2.364e+00; abs: 2.207e-03; rel: 9.328e-04; norm: 9.628e-02; mom: 1.413e+00;
## best it: 230; best obj: 2.364e+00
## It: 231; obj: 2.365e+00; abs: 8.577e-04; rel: 3.628e-04; norm: 9.653e-02; mom: 1.028e+00;
## best it: 230; best obj: 2.364e+00
## It: 232; obj: 2.365e+00; abs: 3.241e-05; rel: 1.370e-05; norm: 9.652e-02; mom: 6.919e-01;
## best it: 230; best obj: 2.364e+00
## It: 233; obj: 2.365e+00; abs: 4.504e-04; rel: 1.904e-04; norm: 9.640e-02; mom: 9.276e-01;
## best it: 230; best obj: 2.364e+00
## It: 234; obj: 2.365e+00; abs: 3.892e-04; rel: 1.645e-04; norm: 9.663e-02; mom: 6.433e-01;
## best it: 230; best obj: 2.364e+00
## It: 235; obj: 2.364e+00; abs: 1.015e-03; rel: 4.290e-04; norm: 9.624e-02; mom: 8.560e-01;
## best it: 235; best obj: 2.364e+00
## It: 236; obj: 2.365e+00; abs: 6.485e-04; rel: 2.743e-04; norm: 9.652e-02; mom: 6.576e-01;
## best it: 235; best obj: 2.364e+00
## It: 237; obj: 2.366e+00; abs: 8.129e-04; rel: 3.438e-04; norm: 9.660e-02; mom: 7.067e-01;

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## best it: 235; best obj: 2.364e+00
## It: 238; obj: 2.366e+00; abs: 9.618e-04; rel: 4.066e-04; norm: 9.628e-02; mom: 6.706e-01;
## best it: 235; best obj: 2.364e+00
## It: 239; obj: 2.367e+00; abs: 9.362e-04; rel: 3.956e-04; norm: 9.637e-02; mom: 8.481e-01;
## best it: 235; best obj: 2.364e+00
## It: 240; obj: 2.367e+00; abs: 5.977e-04; rel: 2.524e-04; norm: 9.614e-02; mom: 7.813e-01;
## best it: 235; best obj: 2.364e+00
## It: 241; obj: 2.366e+00; abs: 3.601e-04; rel: 1.521e-04; norm: 9.637e-02; mom: 1.457e+00;
## best it: 235; best obj: 2.364e+00
## It: 242; obj: 2.366e+00; abs: 6.650e-04; rel: 2.810e-04; norm: 9.642e-02; mom: 5.375e-01;
## best it: 235; best obj: 2.364e+00
## It: 243; obj: 2.366e+00; abs: 4.768e-04; rel: 2.015e-04; norm: 9.631e-02; mom: 1.081e+00;
## best it: 235; best obj: 2.364e+00
## It: 244; obj: 2.367e+00; abs: 4.896e-04; rel: 2.069e-04; norm: 9.642e-02; mom: 8.604e-01;
## best it: 235; best obj: 2.364e+00
## It: 245; obj: 2.365e+00; abs: 1.410e-03; rel: 5.959e-04; norm: 9.638e-02; mom: 7.109e-01;
## best it: 235; best obj: 2.364e+00
## It: 246; obj: 2.365e+00; abs: 6.521e-04; rel: 2.757e-04; norm: 9.635e-02; mom: 1.367e+00;
## best it: 235; best obj: 2.364e+00
## It: 247; obj: 2.366e+00; abs: 1.672e-03; rel: 7.070e-04; norm: 9.655e-02; mom: 7.271e-01;
## best it: 235; best obj: 2.364e+00
## It: 248; obj: 2.367e+00; abs: 2.386e-04; rel: 1.008e-04; norm: 9.629e-02; mom: 1.214e+00;
## best it: 235; best obj: 2.364e+00
## It: 249; obj: 2.367e+00; abs: 2.115e-05; rel: 8.935e-06; norm: 9.625e-02; mom: 1.545e+00;
## best it: 235; best obj: 2.364e+00
## It: 250; obj: 2.366e+00; abs: 6.340e-04; rel: 2.679e-04; norm: 9.658e-02; mom: 1.672e+00;
## best it: 235; best obj: 2.364e+00

## It: 251; obj: 2.366e+00; abs: 2.323e-04; rel: 9.819e-05; norm: 9.610e-02; mom: 1.371e+00;
## best it: 235; best obj: 2.364e+00
## It: 252; obj: 2.367e+00; abs: 7.825e-04; rel: 3.307e-04; norm: 9.640e-02; mom: 1.509e+00;
## best it: 235; best obj: 2.364e+00
## It: 253; obj: 2.368e+00; abs: 6.628e-04; rel: 2.800e-04; norm: 9.669e-02; mom: 1.666e+00;
## best it: 235; best obj: 2.364e+00
## It: 254; obj: 2.368e+00; abs: 5.316e-05; rel: 2.245e-05; norm: 9.614e-02; mom: 1.454e+00;
## best it: 235; best obj: 2.364e+00
## It: 255; obj: 2.367e+00; abs: 4.700e-04; rel: 1.985e-04; norm: 9.635e-02; mom: 1.686e+00;
## best it: 235; best obj: 2.364e+00
## It: 256; obj: 2.367e+00; abs: 4.495e-04; rel: 1.899e-04; norm: 9.608e-02; mom: 1.720e+00;
## best it: 235; best obj: 2.364e+00
## It: 257; obj: 2.367e+00; abs: 4.483e-04; rel: 1.894e-04; norm: 9.593e-02; mom: 1.647e+00;
## best it: 235; best obj: 2.364e+00
## It: 258; obj: 2.370e+00; abs: 2.810e-03; rel: 1.187e-03; norm: 9.643e-02; mom: 1.530e+00;
## best it: 235; best obj: 2.364e+00
## It: 259; obj: 2.372e+00; abs: 1.635e-03; rel: 6.897e-04; norm: 9.637e-02; mom: 2.047e+00;
## best it: 235; best obj: 2.364e+00
## It: 260; obj: 2.372e+00; abs: 6.129e-04; rel: 2.584e-04; norm: 9.620e-02; mom: 1.771e+00;
## best it: 235; best obj: 2.364e+00
## It: 261; obj: 2.371e+00; abs: 1.084e-03; rel: 4.570e-04; norm: 9.637e-02; mom: 2.292e+00;
## best it: 235; best obj: 2.364e+00
## It: 262; obj: 2.369e+00; abs: 1.748e-03; rel: 7.372e-04; norm: 9.607e-02; mom: 2.000e+00;
## best it: 235; best obj: 2.364e+00
## It: 263; obj: 2.369e+00; abs: 8.486e-05; rel: 3.581e-05; norm: 9.628e-02; mom: 1.615e+00;
## best it: 235; best obj: 2.364e+00

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## It: 264; obj: 2.371e+00; abs: 1.644e-03; rel: 6.938e-04; norm: 9.645e-02; mom: 1.993e+00;
## best it: 235; best obj: 2.364e+00
## It: 265; obj: 2.374e+00; abs: 2.551e-03; rel: 1.076e-03; norm: 9.578e-02; mom: 1.883e+00;
## best it: 235; best obj: 2.364e+00
## It: 266; obj: 2.373e+00; abs: 5.325e-04; rel: 2.243e-04; norm: 9.584e-02; mom: 1.710e+00;
## best it: 235; best obj: 2.364e+00
## It: 267; obj: 2.371e+00; abs: 2.042e-03; rel: 8.603e-04; norm: 9.591e-02; mom: 2.351e+00;
## best it: 235; best obj: 2.364e+00
## It: 268; obj: 2.371e+00; abs: 2.552e-04; rel: 1.076e-04; norm: 9.604e-02; mom: 2.146e+00;
## best it: 235; best obj: 2.364e+00
## It: 269; obj: 2.372e+00; abs: 1.076e-03; rel: 4.538e-04; norm: 9.639e-02; mom: 1.959e+00;
## best it: 235; best obj: 2.364e+00
## It: 270; obj: 2.375e+00; abs: 3.513e-03; rel: 1.481e-03; norm: 9.650e-02; mom: 2.144e+00;
## best it: 235; best obj: 2.364e+00
## It: 271; obj: 2.377e+00; abs: 1.561e-03; rel: 6.573e-04; norm: 9.616e-02; mom: 2.260e+00;
## best it: 235; best obj: 2.364e+00
## It: 272; obj: 2.374e+00; abs: 2.633e-03; rel: 1.108e-03; norm: 9.607e-02; mom: 2.419e+00;
## best it: 235; best obj: 2.364e+00
## It: 273; obj: 2.371e+00; abs: 3.159e-03; rel: 1.330e-03; norm: 9.560e-02; mom: 2.326e+00;
## best it: 235; best obj: 2.364e+00
## It: 274; obj: 2.371e+00; abs: 3.590e-05; rel: 1.514e-05; norm: 9.588e-02; mom: 2.230e+00;
## best it: 235; best obj: 2.364e+00
## It: 275; obj: 2.373e+00; abs: 2.136e-03; rel: 9.009e-04; norm: 9.604e-02; mom: 1.968e+00;
## best it: 235; best obj: 2.364e+00

## It: 276; obj: 2.377e+00; abs: 3.900e-03; rel: 1.643e-03; norm: 9.611e-02; mom: 2.039e+00;
## best it: 235; best obj: 2.364e+00
## It: 277; obj: 2.378e+00; abs: 1.125e-03; rel: 4.731e-04; norm: 9.620e-02; mom: 1.843e+00;
## best it: 235; best obj: 2.364e+00
## It: 278; obj: 2.377e+00; abs: 1.206e-03; rel: 5.072e-04; norm: 9.571e-02; mom: 2.466e+00;
## best it: 235; best obj: 2.364e+00
## It: 279; obj: 2.376e+00; abs: 1.283e-03; rel: 5.399e-04; norm: 9.587e-02; mom: 2.399e+00;
## best it: 235; best obj: 2.364e+00
## It: 280; obj: 2.373e+00; abs: 3.324e-03; rel: 1.399e-03; norm: 9.573e-02; mom: 1.814e+00;
## best it: 235; best obj: 2.364e+00
## It: 281; obj: 2.374e+00; abs: 1.958e-03; rel: 8.255e-04; norm: 9.582e-02; mom: 2.511e+00;
## best it: 235; best obj: 2.364e+00
## It: 282; obj: 2.379e+00; abs: 5.004e-03; rel: 2.108e-03; norm: 9.602e-02; mom: 2.154e+00;
## best it: 235; best obj: 2.364e+00
## It: 283; obj: 2.380e+00; abs: 9.966e-04; rel: 4.188e-04; norm: 9.609e-02; mom: 2.101e+00;
## best it: 235; best obj: 2.364e+00
## It: 284; obj: 2.377e+00; abs: 3.003e-03; rel: 1.262e-03; norm: 9.576e-02; mom: 2.805e+00;
## best it: 235; best obj: 2.364e+00
## It: 285; obj: 2.377e+00; abs: 2.540e-04; rel: 1.068e-04; norm: 9.620e-02; mom: 2.540e+00;
## best it: 235; best obj: 2.364e+00
## It: 286; obj: 2.380e+00; abs: 2.460e-03; rel: 1.035e-03; norm: 9.601e-02; mom: 2.279e+00;
## best it: 235; best obj: 2.364e+00
## It: 287; obj: 2.380e+00; abs: 1.398e-05; rel: 5.876e-06; norm: 9.535e-02; mom: 2.689e+00;
## best it: 235; best obj: 2.364e+00
## It: 288; obj: 2.380e+00; abs: 2.282e-04; rel: 9.588e-05; norm: 9.576e-02; mom: 2.669e+00;
## best it: 235; best obj: 2.364e+00
## It: 289; obj: 2.378e+00; abs: 1.689e-03; rel: 7.096e-04; norm: 9.571e-02; mom: 2.468e+00;
## best it: 235; best obj: 2.364e+00
## It: 290; obj: 2.380e+00; abs: 2.216e-03; rel: 9.320e-04; norm: 9.573e-02; mom: 2.413e+00;

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## best it: 235; best obj: 2.364e+00
## It: 291; obj: 2.379e+00; abs: 1.132e-03; rel: 4.757e-04; norm: 9.584e-02; mom: 2.822e+00;
## best it: 235; best obj: 2.364e+00
## It: 292; obj: 2.379e+00; abs: 5.035e-05; rel: 2.116e-05; norm: 9.570e-02; mom: 2.468e+00;
## best it: 235; best obj: 2.364e+00
## It: 293; obj: 2.384e+00; abs: 4.429e-03; rel: 1.861e-03; norm: 9.582e-02; mom: 2.500e+00;
## best it: 235; best obj: 2.364e+00
## It: 294; obj: 2.380e+00; abs: 3.484e-03; rel: 1.461e-03; norm: 9.601e-02; mom: 2.706e+00;
## best it: 235; best obj: 2.364e+00
## It: 295; obj: 2.380e+00; abs: 3.735e-04; rel: 1.569e-04; norm: 9.562e-02; mom: 2.778e+00;
## best it: 235; best obj: 2.364e+00
## It: 296; obj: 2.381e+00; abs: 1.437e-03; rel: 6.039e-04; norm: 9.569e-02; mom: 2.874e+00;
## best it: 235; best obj: 2.364e+00
## It: 297; obj: 2.380e+00; abs: 1.540e-03; rel: 6.465e-04; norm: 9.574e-02; mom: 2.408e+00;
## best it: 235; best obj: 2.364e+00
## It: 298; obj: 2.382e+00; abs: 1.904e-03; rel: 8.002e-04; norm: 9.558e-02; mom: 3.128e+00;
## best it: 235; best obj: 2.364e+00
## It: 299; obj: 2.382e+00; abs: 1.597e-04; rel: 6.705e-05; norm: 9.575e-02; mom: 2.371e+00;
## best it: 235; best obj: 2.364e+00
## It: 300; obj: 2.378e+00; abs: 3.634e-03; rel: 1.526e-03; norm: 9.569e-02; mom: 2.851e+00;
## best it: 235; best obj: 2.364e+00

## It: 301; obj: 2.377e+00; abs: 1.074e-03; rel: 4.517e-04; norm: 9.579e-02; mom: 2.623e+00;
## best it: 235; best obj: 2.364e+00
## It: 302; obj: 2.375e+00; abs: 1.642e-03; rel: 6.907e-04; norm: 9.584e-02; mom: 2.317e+00;
## best it: 235; best obj: 2.364e+00
## It: 303; obj: 2.380e+00; abs: 5.098e-03; rel: 2.146e-03; norm: 9.571e-02; mom: 2.335e+00;
## best it: 235; best obj: 2.364e+00
## It: 304; obj: 2.382e+00; abs: 1.881e-03; rel: 7.904e-04; norm: 9.578e-02; mom: 2.311e+00;
## best it: 235; best obj: 2.364e+00
## It: 305; obj: 2.382e+00; abs: 4.171e-04; rel: 1.751e-04; norm: 9.584e-02; mom: 2.373e+00;
## best it: 235; best obj: 2.364e+00
## It: 306; obj: 2.377e+00; abs: 4.972e-03; rel: 2.088e-03; norm: 9.564e-02; mom: 2.656e+00;
## best it: 235; best obj: 2.364e+00
## It: 307; obj: 2.375e+00; abs: 1.895e-03; rel: 7.974e-04; norm: 9.549e-02; mom: 2.738e+00;
## best it: 235; best obj: 2.364e+00
## It: 308; obj: 2.374e+00; abs: 9.522e-04; rel: 4.009e-04; norm: 9.547e-02; mom: 2.112e+00;
## best it: 235; best obj: 2.364e+00
## It: 309; obj: 2.380e+00; abs: 6.242e-03; rel: 2.629e-03; norm: 9.565e-02; mom: 2.477e+00;
## best it: 235; best obj: 2.364e+00
## It: 310; obj: 2.382e+00; abs: 1.974e-03; rel: 8.292e-04; norm: 9.587e-02; mom: 1.932e+00;
## best it: 235; best obj: 2.364e+00
## It: 311; obj: 2.382e+00; abs: 8.168e-05; rel: 3.429e-05; norm: 9.563e-02; mom: 2.636e+00;
## best it: 235; best obj: 2.364e+00
## It: 312; obj: 2.379e+00; abs: 3.435e-03; rel: 1.442e-03; norm: 9.608e-02; mom: 2.468e+00;
## best it: 235; best obj: 2.364e+00
## It: 313; obj: 2.377e+00; abs: 2.054e-03; rel: 8.637e-04; norm: 9.601e-02; mom: 2.848e+00;
## best it: 235; best obj: 2.364e+00
## It: 314; obj: 2.376e+00; abs: 2.339e-04; rel: 9.842e-05; norm: 9.513e-02; mom: 2.514e+00;
## best it: 235; best obj: 2.364e+00
## It: 315; obj: 2.384e+00; abs: 7.490e-03; rel: 3.152e-03; norm: 9.569e-02; mom: 2.803e+00;
## best it: 235; best obj: 2.364e+00
## It: 316; obj: 2.383e+00; abs: 1.264e-03; rel: 5.302e-04; norm: 9.615e-02; mom: 2.673e+00;
## best it: 235; best obj: 2.364e+00

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## It: 317; obj: 2.379e+00; abs: 3.279e-03; rel: 1.376e-03; norm: 9.533e-02; mom: 2.804e+00;
## best it: 235; best obj: 2.364e+00
## It: 318; obj: 2.380e+00; abs: 2.042e-04; rel: 8.583e-05; norm: 9.616e-02; mom: 2.789e+00;
## best it: 235; best obj: 2.364e+00
## It: 319; obj: 2.380e+00; abs: 9.414e-04; rel: 3.956e-04; norm: 9.630e-02; mom: 2.822e+00;
## best it: 235; best obj: 2.364e+00
## It: 320; obj: 2.376e+00; abs: 4.284e-03; rel: 1.800e-03; norm: 9.533e-02; mom: 2.551e+00;
## best it: 235; best obj: 2.364e+00
## It: 321; obj: 2.380e+00; abs: 4.328e-03; rel: 1.821e-03; norm: 9.597e-02; mom: 2.863e+00;
## best it: 235; best obj: 2.364e+00
## It: 322; obj: 2.384e+00; abs: 3.441e-03; rel: 1.445e-03; norm: 9.617e-02; mom: 2.566e+00;
## best it: 235; best obj: 2.364e+00
## It: 323; obj: 2.383e+00; abs: 1.232e-03; rel: 5.166e-04; norm: 9.537e-02; mom: 2.961e+00;
## best it: 235; best obj: 2.364e+00
## It: 324; obj: 2.383e+00; abs: 7.931e-04; rel: 3.329e-04; norm: 9.592e-02; mom: 2.905e+00;
## best it: 235; best obj: 2.364e+00
## It: 325; obj: 2.381e+00; abs: 2.576e-03; rel: 1.081e-03; norm: 9.616e-02; mom: 2.880e+00;
## best it: 235; best obj: 2.364e+00
## It: 326; obj: 2.381e+00; abs: 9.039e-05; rel: 3.797e-05; norm: 9.546e-02; mom: 2.985e+00;
## best it: 235; best obj: 2.364e+00
## It: 327; obj: 2.380e+00; abs: 9.481e-04; rel: 3.982e-04; norm: 9.587e-02; mom: 2.792e+00;
## best it: 235; best obj: 2.364e+00
## It: 328; obj: 2.379e+00; abs: 6.850e-04; rel: 2.878e-04; norm: 9.587e-02; mom: 2.623e+00;
## best it: 235; best obj: 2.364e+00
## It: 329; obj: 2.378e+00; abs: 1.129e-03; rel: 4.747e-04; norm: 9.580e-02; mom: 2.548e+00;
## best it: 235; best obj: 2.364e+00
## It: 330; obj: 2.382e+00; abs: 4.246e-03; rel: 1.786e-03; norm: 9.612e-02; mom: 2.555e+00;
## best it: 235; best obj: 2.364e+00
## It: 331; obj: 2.383e+00; abs: 1.174e-03; rel: 4.930e-04; norm: 9.568e-02; mom: 2.374e+00;
## best it: 235; best obj: 2.364e+00
## It: 332; obj: 2.382e+00; abs: 1.514e-03; rel: 6.351e-04; norm: 9.573e-02; mom: 2.960e+00;
## best it: 235; best obj: 2.364e+00
## It: 333; obj: 2.381e+00; abs: 7.625e-04; rel: 3.201e-04; norm: 9.569e-02; mom: 2.757e+00;
## best it: 235; best obj: 2.364e+00
## It: 334; obj: 2.377e+00; abs: 4.125e-03; rel: 1.732e-03; norm: 9.585e-02; mom: 2.905e+00;
## best it: 235; best obj: 2.364e+00
## It: 335; obj: 2.381e+00; abs: 3.442e-03; rel: 1.448e-03; norm: 9.590e-02; mom: 2.733e+00;
## best it: 235; best obj: 2.364e+00
## It: 336; obj: 2.387e+00; abs: 6.650e-03; rel: 2.794e-03; norm: 9.568e-02; mom: 2.512e+00;
## best it: 235; best obj: 2.364e+00
## It: 337; obj: 2.384e+00; abs: 2.834e-03; rel: 1.187e-03; norm: 9.588e-02; mom: 2.760e+00;
## best it: 235; best obj: 2.364e+00
## It: 338; obj: 2.381e+00; abs: 3.733e-03; rel: 1.566e-03; norm: 9.551e-02; mom: 3.366e+00;
## best it: 235; best obj: 2.364e+00
## It: 339; obj: 2.381e+00; abs: 3.108e-04; rel: 1.305e-04; norm: 9.571e-02; mom: 2.830e+00;
## best it: 235; best obj: 2.364e+00
## It: 340; obj: 2.377e+00; abs: 3.450e-03; rel: 1.449e-03; norm: 9.623e-02; mom: 2.847e+00;
## best it: 235; best obj: 2.364e+00
## It: 341; obj: 2.382e+00; abs: 4.877e-03; rel: 2.051e-03; norm: 9.578e-02; mom: 2.782e+00;
## best it: 235; best obj: 2.364e+00
## It: 342; obj: 2.387e+00; abs: 4.511e-03; rel: 1.893e-03; norm: 9.568e-02; mom: 2.619e+00;
## best it: 235; best obj: 2.364e+00
## It: 343; obj: 2.387e+00; abs: 2.532e-04; rel: 1.061e-04; norm: 9.611e-02; mom: 2.671e+00;

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## best it: 235; best obj: 2.364e+00
## It: 344; obj: 2.378e+00; abs: 9.105e-03; rel: 3.815e-03; norm: 9.566e-02; mom: 2.814e+00;
## best it: 235; best obj: 2.364e+00
## It: 345; obj: 2.378e+00; abs: 6.323e-05; rel: 2.659e-05; norm: 9.554e-02; mom: 3.090e+00;
## best it: 235; best obj: 2.364e+00
## It: 346; obj: 2.381e+00; abs: 3.068e-03; rel: 1.291e-03; norm: 9.598e-02; mom: 2.736e+00;
## best it: 235; best obj: 2.364e+00
## It: 347; obj: 2.383e+00; abs: 2.015e-03; rel: 8.465e-04; norm: 9.601e-02; mom: 2.343e+00;
## best it: 235; best obj: 2.364e+00
## It: 348; obj: 2.389e+00; abs: 6.445e-03; rel: 2.705e-03; norm: 9.574e-02; mom: 2.923e+00;
## best it: 235; best obj: 2.364e+00
## It: 349; obj: 2.387e+00; abs: 2.508e-03; rel: 1.050e-03; norm: 9.601e-02; mom: 2.600e+00;
## best it: 235; best obj: 2.364e+00
## It: 350; obj: 2.378e+00; abs: 8.369e-03; rel: 3.507e-03; norm: 9.565e-02; mom: 3.122e+00;
## best it: 235; best obj: 2.364e+00

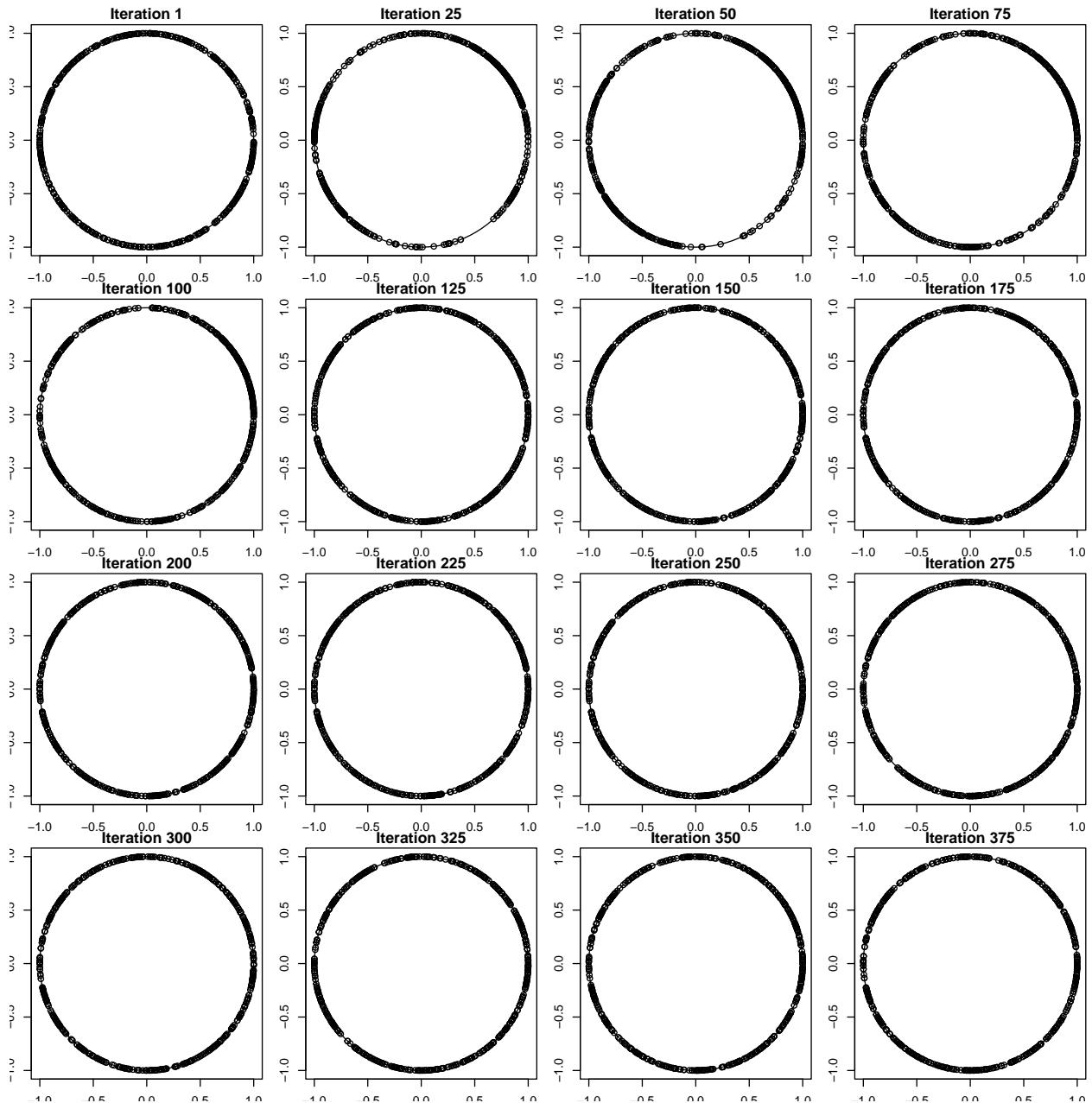
## It: 351; obj: 2.377e+00; abs: 1.110e-03; rel: 4.668e-04; norm: 9.574e-02; mom: 3.148e+00;
## best it: 235; best obj: 2.364e+00
## It: 352; obj: 2.378e+00; abs: 1.310e-03; rel: 5.511e-04; norm: 9.595e-02; mom: 2.656e+00;
## best it: 235; best obj: 2.364e+00
## It: 353; obj: 2.382e+00; abs: 3.605e-03; rel: 1.516e-03; norm: 9.548e-02; mom: 2.511e+00;
## best it: 235; best obj: 2.364e+00
## It: 354; obj: 2.387e+00; abs: 5.178e-03; rel: 2.174e-03; norm: 9.561e-02; mom: 2.485e+00;
## best it: 235; best obj: 2.364e+00
## It: 355; obj: 2.387e+00; abs: 3.523e-04; rel: 1.476e-04; norm: 9.572e-02; mom: 2.418e+00;
## best it: 235; best obj: 2.364e+00
## It: 356; obj: 2.377e+00; abs: 9.939e-03; rel: 4.164e-03; norm: 9.556e-02; mom: 3.041e+00;
## best it: 235; best obj: 2.364e+00
## It: 357; obj: 2.376e+00; abs: 1.099e-03; rel: 4.624e-04; norm: 9.595e-02; mom: 3.147e+00;
## best it: 235; best obj: 2.364e+00
## It: 358; obj: 2.378e+00; abs: 2.276e-03; rel: 9.580e-04; norm: 9.579e-02; mom: 2.306e+00;
## best it: 235; best obj: 2.364e+00
## It: 359; obj: 2.381e+00; abs: 3.395e-03; rel: 1.427e-03; norm: 9.558e-02; mom: 2.388e+00;
## best it: 235; best obj: 2.364e+00
## It: 360; obj: 2.389e+00; abs: 7.254e-03; rel: 3.046e-03; norm: 9.612e-02; mom: 2.460e+00;
## best it: 235; best obj: 2.364e+00
## It: 361; obj: 2.386e+00; abs: 2.612e-03; rel: 1.094e-03; norm: 9.559e-02; mom: 2.452e+00;
## best it: 235; best obj: 2.364e+00
## It: 362; obj: 2.377e+00; abs: 9.577e-03; rel: 4.014e-03; norm: 9.604e-02; mom: 3.454e+00;
## best it: 235; best obj: 2.364e+00
## It: 363; obj: 2.375e+00; abs: 1.404e-03; rel: 5.908e-04; norm: 9.595e-02; mom: 2.743e+00;
## best it: 235; best obj: 2.364e+00
## It: 364; obj: 2.376e+00; abs: 8.932e-04; rel: 3.761e-04; norm: 9.581e-02; mom: 2.439e+00;
## best it: 235; best obj: 2.364e+00
## It: 365; obj: 2.380e+00; abs: 4.245e-03; rel: 1.786e-03; norm: 9.573e-02; mom: 2.742e+00;
## best it: 235; best obj: 2.364e+00
## It: 366; obj: 2.388e+00; abs: 7.501e-03; rel: 3.151e-03; norm: 9.571e-02; mom: 2.535e+00;
## best it: 235; best obj: 2.364e+00
## It: 367; obj: 2.388e+00; abs: 3.722e-04; rel: 1.559e-04; norm: 9.549e-02; mom: 2.478e+00;
## best it: 235; best obj: 2.364e+00
## It: 368; obj: 2.380e+00; abs: 7.862e-03; rel: 3.292e-03; norm: 9.616e-02; mom: 3.015e+00;
## best it: 235; best obj: 2.364e+00
## It: 369; obj: 2.375e+00; abs: 5.742e-03; rel: 2.412e-03; norm: 9.557e-02; mom: 3.200e+00;
## best it: 235; best obj: 2.364e+00

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## It: 370; obj: 2.375e+00; abs: 6.313e-04; rel: 2.659e-04; norm: 9.579e-02; mom: 3.018e+00;
## best it: 235; best obj: 2.364e+00
## It: 371; obj: 2.380e+00; abs: 4.872e-03; rel: 2.051e-03; norm: 9.616e-02; mom: 2.942e+00;
## best it: 235; best obj: 2.364e+00
## It: 372; obj: 2.385e+00; abs: 4.686e-03; rel: 1.969e-03; norm: 9.548e-02; mom: 2.289e+00;
## best it: 235; best obj: 2.364e+00
## It: 373; obj: 2.387e+00; abs: 1.868e-03; rel: 7.832e-04; norm: 9.568e-02; mom: 2.896e+00;
## best it: 235; best obj: 2.364e+00
## It: 374; obj: 2.382e+00; abs: 4.165e-03; rel: 1.745e-03; norm: 9.631e-02; mom: 2.859e+00;
## best it: 235; best obj: 2.364e+00
## It: 375; obj: 2.378e+00; abs: 4.908e-03; rel: 2.060e-03; norm: 9.552e-02; mom: 2.942e+00;
## best it: 235; best obj: 2.364e+00

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## It: 376; obj: 2.375e+00; abs: 2.165e-03; rel: 9.105e-04; norm: 9.583e-02; mom: 3.063e+00;

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## best it: 235; best obj: 2.364e+00
## It: 377; obj: 2.380e+00; abs: 4.313e-03; rel: 1.816e-03; norm: 9.600e-02; mom: 3.104e+00;
## best it: 235; best obj: 2.364e+00
## It: 378; obj: 2.384e+00; abs: 4.770e-03; rel: 2.004e-03; norm: 9.553e-02; mom: 2.214e+00;
## best it: 235; best obj: 2.364e+00
## It: 379; obj: 2.385e+00; abs: 6.512e-04; rel: 2.731e-04; norm: 9.561e-02; mom: 2.761e+00;
## best it: 235; best obj: 2.364e+00
## It: 380; obj: 2.382e+00; abs: 3.404e-03; rel: 1.427e-03; norm: 9.628e-02; mom: 2.844e+00;
## best it: 235; best obj: 2.364e+00
## It: 381; obj: 2.379e+00; abs: 2.858e-03; rel: 1.200e-03; norm: 9.575e-02; mom: 2.674e+00;
## best it: 235; best obj: 2.364e+00
## It: 382; obj: 2.375e+00; abs: 4.057e-03; rel: 1.705e-03; norm: 9.588e-02; mom: 2.989e+00;
## best it: 235; best obj: 2.364e+00
## It: 383; obj: 2.378e+00; abs: 2.857e-03; rel: 1.203e-03; norm: 9.576e-02; mom: 2.816e+00;
## best it: 235; best obj: 2.364e+00
## It: 384; obj: 2.384e+00; abs: 6.510e-03; rel: 2.738e-03; norm: 9.602e-02; mom: 2.991e+00;
## best it: 235; best obj: 2.364e+00
## It: 385; obj: 2.386e+00; abs: 2.297e-03; rel: 9.633e-04; norm: 9.578e-02; mom: 2.362e+00;
## best it: 235; best obj: 2.364e+00
## It: 386; obj: 2.379e+00; abs: 7.354e-03; rel: 3.082e-03; norm: 9.553e-02; mom: 2.773e+00;
## best it: 235; best obj: 2.364e+00
## It: 387; obj: 2.378e+00; abs: 9.125e-04; rel: 3.835e-04; norm: 9.610e-02; mom: 3.229e+00;
## best it: 235; best obj: 2.364e+00
## It: 388; obj: 2.382e+00; abs: 3.595e-03; rel: 1.512e-03; norm: 9.596e-02; mom: 2.505e+00;
## best it: 235; best obj: 2.364e+00
## It: 389; obj: 2.379e+00; abs: 2.660e-03; rel: 1.117e-03; norm: 9.532e-02; mom: 2.339e+00;
## best it: 235; best obj: 2.364e+00
## It: 390; obj: 2.386e+00; abs: 6.717e-03; rel: 2.823e-03; norm: 9.598e-02; mom: 3.090e+00;
## best it: 235; best obj: 2.364e+00
## It: 391; obj: 2.386e+00; abs: 6.028e-04; rel: 2.527e-04; norm: 9.587e-02; mom: 2.685e+00;
## best it: 235; best obj: 2.364e+00
## It: 392; obj: 2.379e+00; abs: 7.806e-03; rel: 3.271e-03; norm: 9.567e-02; mom: 2.965e+00;
## best it: 235; best obj: 2.364e+00
## It: 393; obj: 2.378e+00; abs: 2.650e-04; rel: 1.114e-04; norm: 9.594e-02; mom: 2.988e+00;
## best it: 235; best obj: 2.364e+00
## It: 394; obj: 2.381e+00; abs: 2.976e-03; rel: 1.251e-03; norm: 9.570e-02; mom: 2.580e+00;
## best it: 235; best obj: 2.364e+00
## It: 395; obj: 2.382e+00; abs: 5.099e-04; rel: 2.141e-04; norm: 9.595e-02; mom: 2.789e+00;
## best it: 235; best obj: 2.364e+00
## It: 396; obj: 2.384e+00; abs: 2.486e-03; rel: 1.044e-03; norm: 9.600e-02; mom: 2.808e+00;
## best it: 235; best obj: 2.364e+00
## It: 397; obj: 2.384e+00; abs: 3.011e-04; rel: 1.263e-04; norm: 9.567e-02; mom: 2.853e+00;
## best it: 235; best obj: 2.364e+00
## It: 398; obj: 2.378e+00; abs: 5.910e-03; rel: 2.479e-03; norm: 9.594e-02; mom: 2.804e+00;
## best it: 235; best obj: 2.364e+00
## It: 399; obj: 2.377e+00; abs: 7.596e-04; rel: 3.194e-04; norm: 9.532e-02; mom: 2.995e+00;
## best it: 235; best obj: 2.364e+00
## It: 400; obj: 2.378e+00; abs: 9.568e-04; rel: 4.025e-04; norm: 9.535e-02; mom: 2.564e+00;
## best it: 235; best obj: 2.364e+00
## It: 401; obj: 2.384e+00; abs: 5.415e-03; rel: 2.277e-03; norm: 9.603e-02; mom: 2.702e+00;
## best it: 235; best obj: 2.364e+00
## It: 402; obj: 2.385e+00; abs: 9.900e-04; rel: 4.153e-04; norm: 9.602e-02; mom: 2.390e+00;
## best it: 235; best obj: 2.364e+00

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## It: 403; obj: 2.382e+00; abs: 3.023e-03; rel: 1.268e-03; norm: 9.577e-02; mom: 2.863e+00;
## best it: 235; best obj: 2.364e+00
## It: 404; obj: 2.378e+00; abs: 3.434e-03; rel: 1.442e-03; norm: 9.594e-02; mom: 2.754e+00;
## best it: 235; best obj: 2.364e+00
## It: 405; obj: 2.378e+00; abs: 7.003e-04; rel: 2.944e-04; norm: 9.557e-02; mom: 2.963e+00;
## best it: 235; best obj: 2.364e+00
## It: 406; obj: 2.377e+00; abs: 9.144e-04; rel: 3.846e-04; norm: 9.569e-02; mom: 2.440e+00;
## best it: 235; best obj: 2.364e+00
## It: 407; obj: 2.382e+00; abs: 5.790e-03; rel: 2.436e-03; norm: 9.585e-02; mom: 2.365e+00;
## best it: 235; best obj: 2.364e+00
## It: 408; obj: 2.390e+00; abs: 7.544e-03; rel: 3.167e-03; norm: 9.589e-02; mom: 2.567e+00;
## best it: 235; best obj: 2.364e+00
## It: 409; obj: 2.383e+00; abs: 6.645e-03; rel: 2.781e-03; norm: 9.591e-02; mom: 2.753e+00;
## best it: 235; best obj: 2.364e+00
## It: 410; obj: 2.377e+00; abs: 6.164e-03; rel: 2.586e-03; norm: 9.558e-02; mom: 3.000e+00;
## best it: 235; best obj: 2.364e+00
## It: 411; obj: 2.376e+00; abs: 9.316e-04; rel: 3.919e-04; norm: 9.581e-02; mom: 2.816e+00;
## best it: 235; best obj: 2.364e+00
## It: 412; obj: 2.379e+00; abs: 2.835e-03; rel: 1.193e-03; norm: 9.582e-02; mom: 2.636e+00;
## best it: 235; best obj: 2.364e+00
## It: 413; obj: 2.383e+00; abs: 3.798e-03; rel: 1.597e-03; norm: 9.546e-02; mom: 2.389e+00;
## best it: 235; best obj: 2.364e+00
## It: 414; obj: 2.388e+00; abs: 5.060e-03; rel: 2.124e-03; norm: 9.596e-02; mom: 3.053e+00;
## best it: 235; best obj: 2.364e+00
## It: 415; obj: 2.387e+00; abs: 1.092e-03; rel: 4.573e-04; norm: 9.609e-02; mom: 2.445e+00;
## best it: 235; best obj: 2.364e+00
## It: 416; obj: 2.379e+00; abs: 7.946e-03; rel: 3.329e-03; norm: 9.564e-02; mom: 3.332e+00;
## best it: 235; best obj: 2.364e+00
## It: 417; obj: 2.375e+00; abs: 3.850e-03; rel: 1.618e-03; norm: 9.568e-02; mom: 3.398e+00;
## best it: 235; best obj: 2.364e+00
## It: 418; obj: 2.377e+00; abs: 2.170e-03; rel: 9.136e-04; norm: 9.578e-02; mom: 2.578e+00;
## best it: 235; best obj: 2.364e+00
## It: 419; obj: 2.380e+00; abs: 2.692e-03; rel: 1.133e-03; norm: 9.559e-02; mom: 2.338e+00;
## best it: 235; best obj: 2.364e+00
## It: 420; obj: 2.385e+00; abs: 4.805e-03; rel: 2.019e-03; norm: 9.591e-02; mom: 2.516e+00;
## best it: 235; best obj: 2.364e+00
## It: 421; obj: 2.385e+00; abs: 3.226e-04; rel: 1.353e-04; norm: 9.569e-02; mom: 2.369e+00;
## best it: 235; best obj: 2.364e+00
## It: 422; obj: 2.382e+00; abs: 3.234e-03; rel: 1.356e-03; norm: 9.527e-02; mom: 2.810e+00;
## best it: 235; best obj: 2.364e+00
## It: 423; obj: 2.379e+00; abs: 2.424e-03; rel: 1.018e-03; norm: 9.530e-02; mom: 3.138e+00;
## best it: 235; best obj: 2.364e+00
## It: 424; obj: 2.378e+00; abs: 9.549e-04; rel: 4.013e-04; norm: 9.575e-02; mom: 2.747e+00;
## best it: 235; best obj: 2.364e+00
## It: 425; obj: 2.377e+00; abs: 1.533e-03; rel: 6.444e-04; norm: 9.561e-02; mom: 2.764e+00;
## best it: 235; best obj: 2.364e+00

## It: 426; obj: 2.382e+00; abs: 4.884e-03; rel: 2.055e-03; norm: 9.543e-02; mom: 2.848e+00;
## best it: 235; best obj: 2.364e+00
## It: 427; obj: 2.382e+00; abs: 2.319e-05; rel: 9.737e-06; norm: 9.538e-02; mom: 2.142e+00;
## best it: 235; best obj: 2.364e+00
## It: 428; obj: 2.379e+00; abs: 2.755e-03; rel: 1.157e-03; norm: 9.594e-02; mom: 2.535e+00;
## best it: 235; best obj: 2.364e+00
## It: 429; obj: 2.379e+00; abs: 1.713e-04; rel: 7.200e-05; norm: 9.534e-02; mom: 2.950e+00;

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## best it: 235; best obj: 2.364e+00
## It: 430; obj: 2.378e+00; abs: 7.357e-04; rel: 3.093e-04; norm: 9.541e-02; mom: 2.844e+00;
## best it: 235; best obj: 2.364e+00
## It: 431; obj: 2.378e+00; abs: 1.463e-04; rel: 6.152e-05; norm: 9.580e-02; mom: 2.385e+00;
## best it: 235; best obj: 2.364e+00
## It: 432; obj: 2.383e+00; abs: 4.743e-03; rel: 1.995e-03; norm: 9.589e-02; mom: 2.699e+00;
## best it: 235; best obj: 2.364e+00
## It: 433; obj: 2.383e+00; abs: 4.764e-04; rel: 1.999e-04; norm: 9.538e-02; mom: 2.323e+00;
## best it: 235; best obj: 2.364e+00
## It: 434; obj: 2.381e+00; abs: 2.876e-03; rel: 1.207e-03; norm: 9.581e-02; mom: 3.011e+00;
## best it: 235; best obj: 2.364e+00
## It: 435; obj: 2.384e+00; abs: 3.700e-03; rel: 1.554e-03; norm: 9.555e-02; mom: 2.692e+00;
## best it: 235; best obj: 2.364e+00
## It: 436; obj: 2.381e+00; abs: 3.238e-03; rel: 1.358e-03; norm: 9.561e-02; mom: 3.247e+00;
## best it: 235; best obj: 2.364e+00
## It: 437; obj: 2.378e+00; abs: 2.670e-03; rel: 1.122e-03; norm: 9.616e-02; mom: 2.893e+00;
## best it: 235; best obj: 2.364e+00
## It: 438; obj: 2.381e+00; abs: 2.820e-03; rel: 1.186e-03; norm: 9.575e-02; mom: 2.701e+00;
## best it: 235; best obj: 2.364e+00
## It: 439; obj: 2.381e+00; abs: 4.737e-05; rel: 1.989e-05; norm: 9.558e-02; mom: 2.458e+00;
## best it: 235; best obj: 2.364e+00
## It: 440; obj: 2.378e+00; abs: 3.485e-03; rel: 1.464e-03; norm: 9.570e-02; mom: 2.623e+00;
## best it: 235; best obj: 2.364e+00
## It: 441; obj: 2.383e+00; abs: 4.824e-03; rel: 2.029e-03; norm: 9.536e-02; mom: 2.712e+00;
## best it: 235; best obj: 2.364e+00
## It: 442; obj: 2.384e+00; abs: 1.028e-03; rel: 4.314e-04; norm: 9.550e-02; mom: 2.764e+00;
## best it: 235; best obj: 2.364e+00
## It: 443; obj: 2.380e+00; abs: 3.753e-03; rel: 1.574e-03; norm: 9.591e-02; mom: 2.580e+00;
## best it: 235; best obj: 2.364e+00
## It: 444; obj: 2.381e+00; abs: 1.474e-03; rel: 6.193e-04; norm: 9.570e-02; mom: 2.796e+00;
## best it: 235; best obj: 2.364e+00
## It: 445; obj: 2.381e+00; abs: 1.444e-04; rel: 6.064e-05; norm: 9.569e-02; mom: 2.342e+00;
## best it: 235; best obj: 2.364e+00
## It: 446; obj: 2.378e+00; abs: 3.140e-03; rel: 1.319e-03; norm: 9.579e-02; mom: 2.734e+00;
## best it: 235; best obj: 2.364e+00
## It: 447; obj: 2.381e+00; abs: 2.568e-03; rel: 1.080e-03; norm: 9.542e-02; mom: 2.694e+00;
## best it: 235; best obj: 2.364e+00
## It: 448; obj: 2.385e+00; abs: 3.995e-03; rel: 1.678e-03; norm: 9.538e-02; mom: 2.744e+00;
## best it: 235; best obj: 2.364e+00
## It: 449; obj: 2.382e+00; abs: 2.619e-03; rel: 1.098e-03; norm: 9.587e-02; mom: 2.621e+00;
## best it: 235; best obj: 2.364e+00
## It: 450; obj: 2.383e+00; abs: 1.006e-03; rel: 4.222e-04; norm: 9.605e-02; mom: 2.915e+00;
## best it: 235; best obj: 2.364e+00

## It: 451; obj: 2.381e+00; abs: 1.588e-03; rel: 6.662e-04; norm: 9.598e-02; mom: 2.559e+00;
## best it: 235; best obj: 2.364e+00
## It: 452; obj: 2.380e+00; abs: 1.780e-03; rel: 7.476e-04; norm: 9.555e-02; mom: 2.560e+00;
## best it: 235; best obj: 2.364e+00
## It: 453; obj: 2.378e+00; abs: 1.293e-03; rel: 5.435e-04; norm: 9.539e-02; mom: 2.743e+00;
## best it: 235; best obj: 2.364e+00
## It: 454; obj: 2.383e+00; abs: 5.151e-03; rel: 2.166e-03; norm: 9.559e-02; mom: 3.112e+00;
## best it: 235; best obj: 2.364e+00
## It: 455; obj: 2.384e+00; abs: 6.775e-04; rel: 2.843e-04; norm: 9.563e-02; mom: 2.172e+00;
## best it: 235; best obj: 2.364e+00

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## It: 456; obj: 2.383e+00; abs: 7.870e-04; rel: 3.301e-04; norm: 9.595e-02; mom: 2.986e+00;
## best it: 235; best obj: 2.364e+00
## It: 457; obj: 2.383e+00; abs: 5.480e-04; rel: 2.299e-04; norm: 9.597e-02; mom: 2.537e+00;
## best it: 235; best obj: 2.364e+00
## It: 458; obj: 2.378e+00; abs: 4.576e-03; rel: 1.921e-03; norm: 9.566e-02; mom: 2.567e+00;
## best it: 235; best obj: 2.364e+00
## It: 459; obj: 2.378e+00; abs: 1.331e-04; rel: 5.599e-05; norm: 9.552e-02; mom: 2.964e+00;
## best it: 235; best obj: 2.364e+00
## It: 460; obj: 2.382e+00; abs: 3.470e-03; rel: 1.459e-03; norm: 9.554e-02; mom: 2.854e+00;
## best it: 235; best obj: 2.364e+00
## It: 461; obj: 2.383e+00; abs: 9.415e-04; rel: 3.953e-04; norm: 9.569e-02; mom: 2.453e+00;
## best it: 235; best obj: 2.364e+00
## It: 462; obj: 2.386e+00; abs: 3.274e-03; rel: 1.374e-03; norm: 9.602e-02; mom: 2.741e+00;
## best it: 235; best obj: 2.364e+00
## It: 463; obj: 2.384e+00; abs: 1.807e-03; rel: 7.572e-04; norm: 9.553e-02; mom: 2.712e+00;
## best it: 235; best obj: 2.364e+00
## It: 464; obj: 2.378e+00; abs: 6.142e-03; rel: 2.576e-03; norm: 9.596e-02; mom: 2.727e+00;
## best it: 235; best obj: 2.364e+00
## It: 465; obj: 2.377e+00; abs: 1.500e-03; rel: 6.308e-04; norm: 9.573e-02; mom: 2.971e+00;
## best it: 235; best obj: 2.364e+00
## It: 466; obj: 2.381e+00; abs: 3.940e-03; rel: 1.658e-03; norm: 9.568e-02; mom: 2.737e+00;
## best it: 235; best obj: 2.364e+00
## It: 467; obj: 2.381e+00; abs: 7.894e-04; rel: 3.316e-04; norm: 9.546e-02; mom: 2.392e+00;
## best it: 235; best obj: 2.364e+00
## It: 468; obj: 2.383e+00; abs: 1.232e-03; rel: 5.172e-04; norm: 9.602e-02; mom: 2.685e+00;
## best it: 235; best obj: 2.364e+00
## It: 469; obj: 2.386e+00; abs: 3.434e-03; rel: 1.441e-03; norm: 9.561e-02; mom: 2.525e+00;
## best it: 235; best obj: 2.364e+00
## It: 470; obj: 2.379e+00; abs: 7.146e-03; rel: 2.995e-03; norm: 9.574e-02; mom: 2.696e+00;
## best it: 235; best obj: 2.364e+00
## It: 471; obj: 2.377e+00; abs: 1.487e-03; rel: 6.252e-04; norm: 9.584e-02; mom: 3.016e+00;
## best it: 235; best obj: 2.364e+00
## It: 472; obj: 2.379e+00; abs: 1.223e-03; rel: 5.146e-04; norm: 9.580e-02; mom: 2.361e+00;
## best it: 235; best obj: 2.364e+00
## It: 473; obj: 2.380e+00; abs: 1.871e-03; rel: 7.867e-04; norm: 9.561e-02; mom: 2.406e+00;
## best it: 235; best obj: 2.364e+00
## It: 474; obj: 2.385e+00; abs: 4.953e-03; rel: 2.081e-03; norm: 9.612e-02; mom: 2.804e+00;
## best it: 235; best obj: 2.364e+00
## It: 475; obj: 2.388e+00; abs: 2.281e-03; rel: 9.562e-04; norm: 9.567e-02; mom: 2.438e+00;
## best it: 235; best obj: 2.364e+00

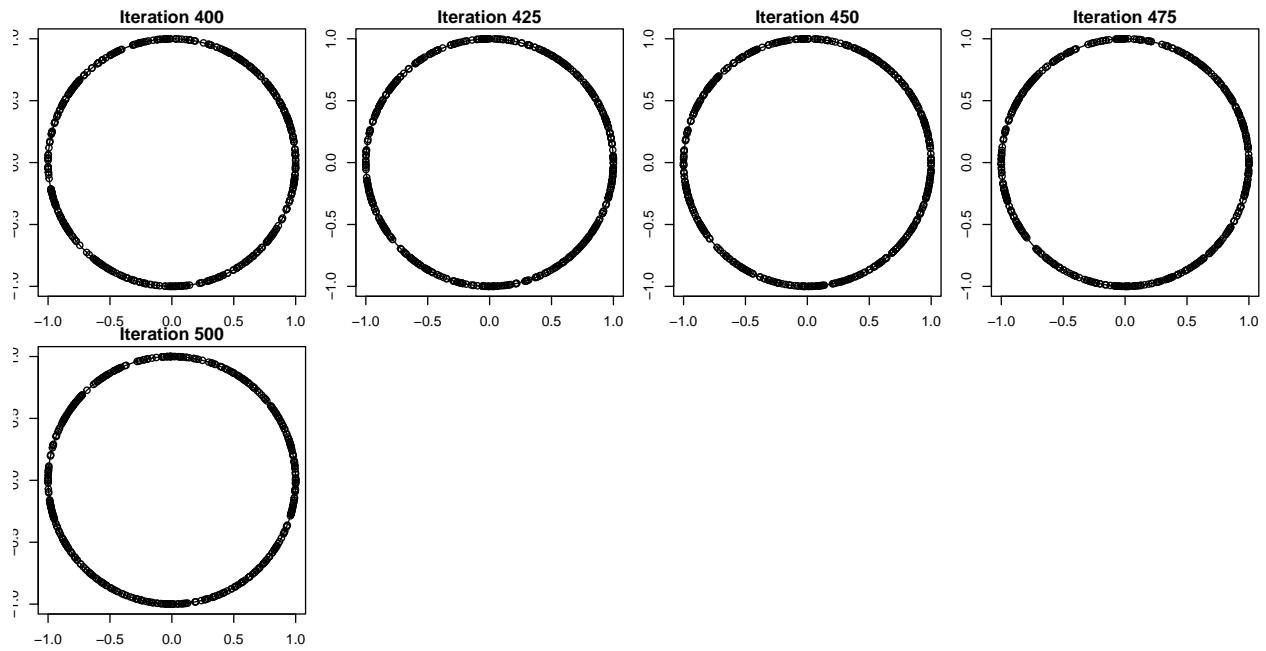
## It: 476; obj: 2.380e+00; abs: 8.197e-03; rel: 3.433e-03; norm: 9.556e-02; mom: 2.785e+00;
## best it: 235; best obj: 2.364e+00
## It: 477; obj: 2.379e+00; abs: 7.025e-04; rel: 2.952e-04; norm: 9.566e-02; mom: 3.459e+00;
## best it: 235; best obj: 2.364e+00
## It: 478; obj: 2.378e+00; abs: 8.754e-04; rel: 3.680e-04; norm: 9.619e-02; mom: 2.412e+00;
## best it: 235; best obj: 2.364e+00
## It: 479; obj: 2.380e+00; abs: 1.883e-03; rel: 7.917e-04; norm: 9.560e-02; mom: 2.718e+00;
## best it: 235; best obj: 2.364e+00
## It: 480; obj: 2.385e+00; abs: 4.780e-03; rel: 2.009e-03; norm: 9.604e-02; mom: 2.644e+00;
## best it: 235; best obj: 2.364e+00
## It: 481; obj: 2.387e+00; abs: 2.697e-03; rel: 1.131e-03; norm: 9.566e-02; mom: 2.490e+00;
## best it: 235; best obj: 2.364e+00
## It: 482; obj: 2.381e+00; abs: 5.905e-03; rel: 2.474e-03; norm: 9.550e-02; mom: 2.938e+00;

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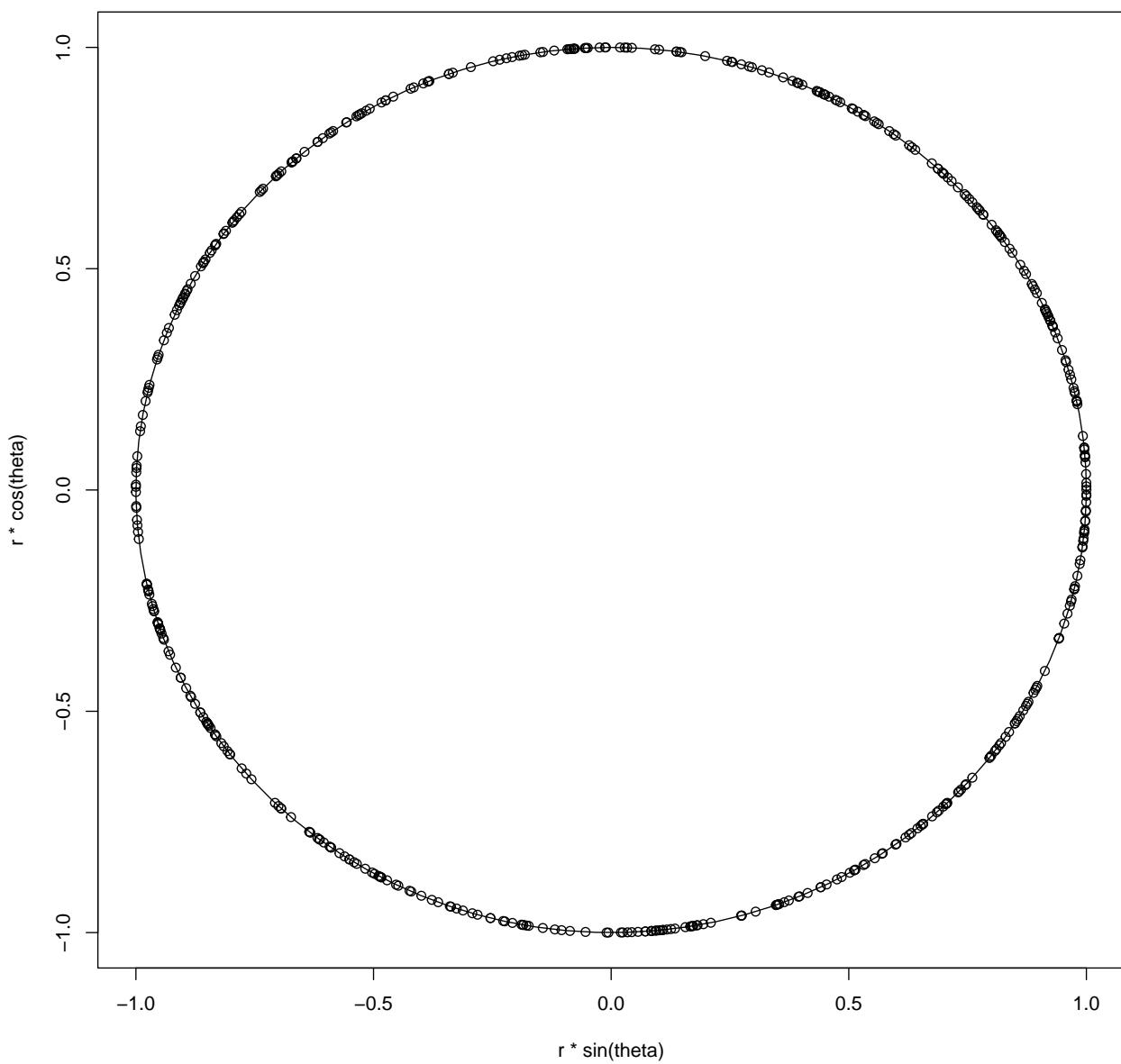
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## best it: 235; best obj: 2.364e+00
## It: 483; obj: 2.378e+00; abs: 3.464e-03; rel: 1.455e-03; norm: 9.563e-02; mom: 3.020e+00;
## best it: 235; best obj: 2.364e+00
## It: 484; obj: 2.378e+00; abs: 5.315e-04; rel: 2.235e-04; norm: 9.603e-02; mom: 2.704e+00;
## best it: 235; best obj: 2.364e+00
## It: 485; obj: 2.379e+00; abs: 9.485e-04; rel: 3.988e-04; norm: 9.605e-02; mom: 2.386e+00;
## best it: 235; best obj: 2.364e+00
## It: 486; obj: 2.383e+00; abs: 3.892e-03; rel: 1.636e-03; norm: 9.598e-02; mom: 2.468e+00;
## best it: 235; best obj: 2.364e+00
## It: 487; obj: 2.383e+00; abs: 1.314e-04; rel: 5.515e-05; norm: 9.536e-02; mom: 2.351e+00;
## best it: 235; best obj: 2.364e+00
## It: 488; obj: 2.381e+00; abs: 2.288e-03; rel: 9.598e-04; norm: 9.509e-02; mom: 3.024e+00;
## best it: 235; best obj: 2.364e+00
## It: 489; obj: 2.380e+00; abs: 7.688e-04; rel: 3.229e-04; norm: 9.543e-02; mom: 2.829e+00;
## best it: 235; best obj: 2.364e+00
## It: 490; obj: 2.377e+00; abs: 3.459e-03; rel: 1.453e-03; norm: 9.586e-02; mom: 2.478e+00;
## best it: 235; best obj: 2.364e+00
## It: 491; obj: 2.380e+00; abs: 3.093e-03; rel: 1.301e-03; norm: 9.579e-02; mom: 2.662e+00;
## best it: 235; best obj: 2.364e+00
## It: 492; obj: 2.383e+00; abs: 2.934e-03; rel: 1.233e-03; norm: 9.578e-02; mom: 2.278e+00;
## best it: 235; best obj: 2.364e+00
## It: 493; obj: 2.383e+00; abs: 4.200e-04; rel: 1.763e-04; norm: 9.527e-02; mom: 2.538e+00;
## best it: 235; best obj: 2.364e+00
## It: 494; obj: 2.380e+00; abs: 3.727e-03; rel: 1.564e-03; norm: 9.553e-02; mom: 2.934e+00;
## best it: 235; best obj: 2.364e+00
## It: 495; obj: 2.378e+00; abs: 1.278e-03; rel: 5.373e-04; norm: 9.532e-02; mom: 2.673e+00;
## best it: 235; best obj: 2.364e+00
## It: 496; obj: 2.379e+00; abs: 6.581e-04; rel: 2.767e-04; norm: 9.531e-02; mom: 2.491e+00;
## best it: 235; best obj: 2.364e+00
## It: 497; obj: 2.380e+00; abs: 6.387e-04; rel: 2.685e-04; norm: 9.583e-02; mom: 2.833e+00;
## best it: 235; best obj: 2.364e+00
## It: 498; obj: 2.384e+00; abs: 3.988e-03; rel: 1.676e-03; norm: 9.596e-02; mom: 2.588e+00;
## best it: 235; best obj: 2.364e+00
## It: 499; obj: 2.384e+00; abs: 7.427e-04; rel: 3.116e-04; norm: 9.569e-02; mom: 2.314e+00;
## best it: 235; best obj: 2.364e+00
## It: 500; obj: 2.381e+00; abs: 3.723e-03; rel: 1.562e-03; norm: 9.553e-02; mom: 2.871e+00;
## best it: 235; best obj: 2.364e+00

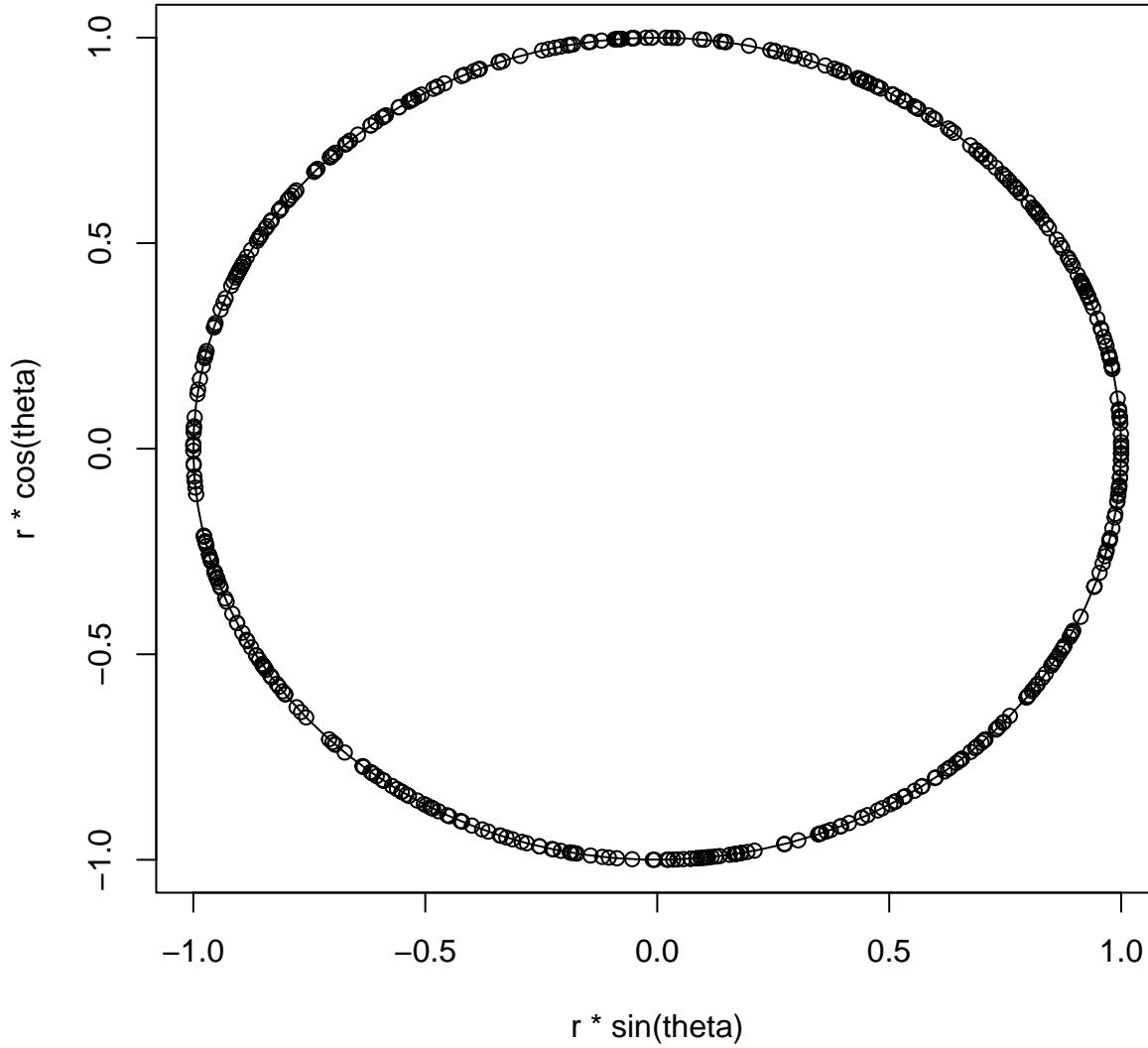
```



### Iteration 235



```
Y <- res_pscsne$best_Y  
  
Y_rad <- DirStats::to_rad(Y)  
r <- 1  
theta <- Y_rad  
plot(r*sin(theta),  
     r*cos(theta),  
     xlim=c(-max(r),max(r)),  
     ylim=c(-max(r),max(r)))  
  
polygon(max(r)*sin(seq(0,2*pi,length.out=100)),max(r)*cos(seq(0,2*pi,length.out=100)))
```



Now we are going to reduce to dimension  $\mathbb{S}^2$  then  $d = 2$  (sphere):

```
res_pscsne <- psc_sne(X=x_4, d=2, rho_psc_list = rho_four_perp20,
                         num_iteration=500, show_prog = TRUE)
```

```
## It: 1; obj: 1.971e+01; abs: 0.000e+00; rel: 0.000e+00; norm: 2.028e-01; mom: 0.000e+00;
## best it: 1; best obj: 1.971e+01

## It: 2; obj: 1.727e+01; abs: 2.440e+00; rel: 1.238e-01; norm: 3.436e-01; mom: 9.416e+00;
## best it: 2; best obj: 1.727e+01
## It: 3; obj: 1.576e+01; abs: 1.508e+00; rel: 8.731e-02; norm: 5.531e-01; mom: 7.463e+00;
## best it: 3; best obj: 1.576e+01
## It: 4; obj: 1.493e+01; abs: 8.375e-01; rel: 5.313e-02; norm: 7.121e-01; mom: 5.001e+00;
## best it: 4; best obj: 1.493e+01
## It: 5; obj: 1.448e+01; abs: 4.503e-01; rel: 3.017e-02; norm: 8.142e-01; mom: 3.287e+00;
## best it: 5; best obj: 1.448e+01
## It: 6; obj: 1.419e+01; abs: 2.869e-01; rel: 1.982e-02; norm: 8.755e-01; mom: 2.242e+00;
## best it: 6; best obj: 1.419e+01
## It: 7; obj: 1.399e+01; abs: 2.001e-01; rel: 1.411e-02; norm: 9.134e-01; mom: 1.714e+00;
## best it: 7; best obj: 1.399e+01
## It: 8; obj: 1.384e+01; abs: 1.502e-01; rel: 1.073e-02; norm: 9.384e-01; mom: 1.411e+00;
```

```

## best it: 8; best obj: 1.384e+01
## It: 9; obj: 1.372e+01; abs: 1.137e-01; rel: 8.218e-03; norm: 9.605e-01; mom: 1.072e+00;
## best it: 9; best obj: 1.372e+01
## It: 10; obj: 1.364e+01; abs: 8.226e-02; rel: 5.994e-03; norm: 9.764e-01; mom: 9.096e-01;
## best it: 10; best obj: 1.364e+01
## It: 11; obj: 1.358e+01; abs: 6.098e-02; rel: 4.470e-03; norm: 9.895e-01; mom: 7.828e-01;
## best it: 11; best obj: 1.358e+01
## It: 12; obj: 1.354e+01; abs: 4.606e-02; rel: 3.392e-03; norm: 9.992e-01; mom: 7.062e-01;
## best it: 12; best obj: 1.354e+01
## It: 13; obj: 1.350e+01; abs: 3.386e-02; rel: 2.501e-03; norm: 1.009e+00; mom: 6.743e-01;
## best it: 13; best obj: 1.350e+01
## It: 14; obj: 1.347e+01; abs: 2.681e-02; rel: 1.986e-03; norm: 1.020e+00; mom: 6.835e-01;
## best it: 14; best obj: 1.347e+01
## It: 15; obj: 1.345e+01; abs: 2.114e-02; rel: 1.569e-03; norm: 1.032e+00; mom: 7.771e-01;
## best it: 15; best obj: 1.345e+01
## It: 16; obj: 1.343e+01; abs: 2.118e-02; rel: 1.574e-03; norm: 1.044e+00; mom: 9.265e-01;
## best it: 16; best obj: 1.343e+01
## It: 17; obj: 1.341e+01; abs: 2.660e-02; rel: 1.980e-03; norm: 1.055e+00; mom: 1.107e+00;
## best it: 17; best obj: 1.341e+01
## It: 18; obj: 1.337e+01; abs: 3.375e-02; rel: 2.518e-03; norm: 1.065e+00; mom: 1.243e+00;
## best it: 18; best obj: 1.337e+01
## It: 19; obj: 1.334e+01; abs: 3.607e-02; rel: 2.697e-03; norm: 1.074e+00; mom: 1.195e+00;
## best it: 19; best obj: 1.334e+01
## It: 20; obj: 1.330e+01; abs: 3.634e-02; rel: 2.725e-03; norm: 1.083e+00; mom: 9.907e-01;
## best it: 20; best obj: 1.330e+01
## It: 21; obj: 1.326e+01; abs: 3.509e-02; rel: 2.639e-03; norm: 1.090e+00; mom: 7.764e-01;
## best it: 21; best obj: 1.326e+01
## It: 22; obj: 1.323e+01; abs: 3.179e-02; rel: 2.397e-03; norm: 1.097e+00; mom: 6.000e-01;
## best it: 22; best obj: 1.323e+01
## It: 23; obj: 1.320e+01; abs: 3.027e-02; rel: 2.287e-03; norm: 1.103e+00; mom: 4.799e-01;
## best it: 23; best obj: 1.320e+01
## It: 24; obj: 1.317e+01; abs: 2.877e-02; rel: 2.179e-03; norm: 1.108e+00; mom: 4.058e-01;
## best it: 24; best obj: 1.317e+01
## It: 25; obj: 1.315e+01; abs: 2.815e-02; rel: 2.137e-03; norm: 1.112e+00; mom: 3.538e-01;
## best it: 25; best obj: 1.315e+01

## It: 26; obj: 1.312e+01; abs: 2.759e-02; rel: 2.099e-03; norm: 1.115e+00; mom: 3.183e-01;
## best it: 26; best obj: 1.312e+01
## It: 27; obj: 1.309e+01; abs: 2.693e-02; rel: 2.053e-03; norm: 1.117e+00; mom: 2.908e-01;
## best it: 27; best obj: 1.309e+01
## It: 28; obj: 1.306e+01; abs: 2.625e-02; rel: 2.005e-03; norm: 1.118e+00; mom: 2.693e-01;
## best it: 28; best obj: 1.306e+01
## It: 29; obj: 1.304e+01; abs: 2.508e-02; rel: 1.919e-03; norm: 1.118e+00; mom: 2.519e-01;
## best it: 29; best obj: 1.304e+01
## It: 30; obj: 1.302e+01; abs: 2.412e-02; rel: 1.850e-03; norm: 1.118e+00; mom: 2.371e-01;
## best it: 30; best obj: 1.302e+01
## It: 31; obj: 1.299e+01; abs: 2.281e-02; rel: 1.753e-03; norm: 1.117e+00; mom: 2.242e-01;
## best it: 31; best obj: 1.299e+01
## It: 32; obj: 1.297e+01; abs: 2.200e-02; rel: 1.693e-03; norm: 1.115e+00; mom: 2.121e-01;
## best it: 32; best obj: 1.297e+01
## It: 33; obj: 1.295e+01; abs: 2.096e-02; rel: 1.616e-03; norm: 1.113e+00; mom: 2.017e-01;
## best it: 33; best obj: 1.295e+01
## It: 34; obj: 1.293e+01; abs: 2.026e-02; rel: 1.564e-03; norm: 1.111e+00; mom: 1.923e-01;
## best it: 34; best obj: 1.293e+01

```

```

## It: 35; obj: 1.291e+01; abs: 1.946e-02; rel: 1.505e-03; norm: 1.108e+00; mom: 1.854e-01;
## best it: 35; best obj: 1.291e+01
## It: 36; obj: 1.289e+01; abs: 1.874e-02; rel: 1.452e-03; norm: 1.104e+00; mom: 1.791e-01;
## best it: 36; best obj: 1.289e+01
## It: 37; obj: 1.287e+01; abs: 1.828e-02; rel: 1.418e-03; norm: 1.101e+00; mom: 1.773e-01;
## best it: 37; best obj: 1.287e+01
## It: 38; obj: 1.286e+01; abs: 1.755e-02; rel: 1.364e-03; norm: 1.097e+00; mom: 1.755e-01;
## best it: 38; best obj: 1.286e+01
## It: 39; obj: 1.284e+01; abs: 1.729e-02; rel: 1.345e-03; norm: 1.093e+00; mom: 1.789e-01;
## best it: 39; best obj: 1.284e+01
## It: 40; obj: 1.282e+01; abs: 1.623e-02; rel: 1.264e-03; norm: 1.089e+00; mom: 1.807e-01;
## best it: 40; best obj: 1.282e+01
## It: 41; obj: 1.281e+01; abs: 1.580e-02; rel: 1.232e-03; norm: 1.085e+00; mom: 1.852e-01;
## best it: 41; best obj: 1.281e+01
## It: 42; obj: 1.279e+01; abs: 1.437e-02; rel: 1.122e-03; norm: 1.081e+00; mom: 1.885e-01;
## best it: 42; best obj: 1.279e+01
## It: 43; obj: 1.278e+01; abs: 1.379e-02; rel: 1.078e-03; norm: 1.078e+00; mom: 1.935e-01;
## best it: 43; best obj: 1.278e+01
## It: 44; obj: 1.277e+01; abs: 1.210e-02; rel: 9.468e-04; norm: 1.076e+00; mom: 1.976e-01;
## best it: 44; best obj: 1.277e+01
## It: 45; obj: 1.275e+01; abs: 1.127e-02; rel: 8.830e-04; norm: 1.075e+00; mom: 2.020e-01;
## best it: 45; best obj: 1.275e+01
## It: 46; obj: 1.275e+01; abs: 9.337e-03; rel: 7.320e-04; norm: 1.076e+00; mom: 2.048e-01;
## best it: 46; best obj: 1.275e+01
## It: 47; obj: 1.274e+01; abs: 8.312e-03; rel: 6.521e-04; norm: 1.078e+00; mom: 2.066e-01;
## best it: 47; best obj: 1.274e+01
## It: 48; obj: 1.273e+01; abs: 6.291e-03; rel: 4.939e-04; norm: 1.082e+00; mom: 2.064e-01;
## best it: 48; best obj: 1.273e+01
## It: 49; obj: 1.273e+01; abs: 5.219e-03; rel: 4.099e-04; norm: 1.085e+00; mom: 2.048e-01;
## best it: 49; best obj: 1.273e+01
## It: 50; obj: 1.272e+01; abs: 3.282e-03; rel: 2.579e-04; norm: 1.089e+00; mom: 2.013e-01;
## best it: 50; best obj: 1.272e+01

## It: 51; obj: 1.272e+01; abs: 2.264e-03; rel: 1.780e-04; norm: 1.093e+00; mom: 1.968e-01;
## best it: 51; best obj: 1.272e+01
## It: 52; obj: 1.272e+01; abs: 4.911e-04; rel: 3.861e-05; norm: 1.097e+00; mom: 1.907e-01;
## best it: 52; best obj: 1.272e+01
## It: 53; obj: 1.272e+01; abs: 4.324e-04; rel: 3.399e-05; norm: 1.101e+00; mom: 1.846e-01;
## best it: 52; best obj: 1.272e+01
## It: 54; obj: 1.272e+01; abs: 1.988e-03; rel: 1.563e-04; norm: 1.105e+00; mom: 1.775e-01;
## best it: 52; best obj: 1.272e+01
## It: 55; obj: 1.272e+01; abs: 2.765e-03; rel: 2.174e-04; norm: 1.109e+00; mom: 1.714e-01;
## best it: 52; best obj: 1.272e+01
## It: 56; obj: 1.273e+01; abs: 4.072e-03; rel: 3.200e-04; norm: 1.113e+00; mom: 1.652e-01;
## best it: 52; best obj: 1.272e+01
## It: 57; obj: 1.273e+01; abs: 4.720e-03; rel: 3.708e-04; norm: 1.117e+00; mom: 1.605e-01;
## best it: 52; best obj: 1.272e+01
## It: 58; obj: 1.274e+01; abs: 5.847e-03; rel: 4.592e-04; norm: 1.121e+00; mom: 1.560e-01;
## best it: 52; best obj: 1.272e+01
## It: 59; obj: 1.275e+01; abs: 6.454e-03; rel: 5.066e-04; norm: 1.125e+00; mom: 1.531e-01;
## best it: 52; best obj: 1.272e+01
## It: 60; obj: 1.275e+01; abs: 7.476e-03; rel: 5.866e-04; norm: 1.130e+00; mom: 1.503e-01;
## best it: 52; best obj: 1.272e+01
## It: 61; obj: 1.276e+01; abs: 8.087e-03; rel: 6.341e-04; norm: 1.134e+00; mom: 1.490e-01;

```

```

## best it: 52; best obj: 1.272e+01
## It: 62; obj: 1.277e+01; abs: 9.053e-03; rel: 7.094e-04; norm: 1.138e+00; mom: 1.482e-01;
## best it: 52; best obj: 1.272e+01
## It: 63; obj: 1.278e+01; abs: 9.737e-03; rel: 7.625e-04; norm: 1.143e+00; mom: 1.493e-01;
## best it: 52; best obj: 1.272e+01
## It: 64; obj: 1.279e+01; abs: 1.077e-02; rel: 8.424e-04; norm: 1.147e+00; mom: 1.511e-01;
## best it: 52; best obj: 1.272e+01
## It: 65; obj: 1.280e+01; abs: 1.163e-02; rel: 9.095e-04; norm: 1.152e+00; mom: 1.538e-01;
## best it: 52; best obj: 1.272e+01
## It: 66; obj: 1.281e+01; abs: 1.276e-02; rel: 9.968e-04; norm: 1.156e+00; mom: 1.548e-01;
## best it: 52; best obj: 1.272e+01
## It: 67; obj: 1.283e+01; abs: 1.361e-02; rel: 1.062e-03; norm: 1.161e+00; mom: 1.528e-01;
## best it: 52; best obj: 1.272e+01
## It: 68; obj: 1.284e+01; abs: 1.445e-02; rel: 1.126e-03; norm: 1.166e+00; mom: 1.469e-01;
## best it: 52; best obj: 1.272e+01
## It: 69; obj: 1.286e+01; abs: 1.503e-02; rel: 1.171e-03; norm: 1.171e+00; mom: 1.403e-01;
## best it: 52; best obj: 1.272e+01
## It: 70; obj: 1.287e+01; abs: 1.568e-02; rel: 1.220e-03; norm: 1.176e+00; mom: 1.356e-01;
## best it: 52; best obj: 1.272e+01
## It: 71; obj: 1.289e+01; abs: 1.598e-02; rel: 1.241e-03; norm: 1.181e+00; mom: 1.346e-01;
## best it: 52; best obj: 1.272e+01
## It: 72; obj: 1.291e+01; abs: 1.611e-02; rel: 1.250e-03; norm: 1.186e+00; mom: 1.377e-01;
## best it: 52; best obj: 1.272e+01
## It: 73; obj: 1.292e+01; abs: 1.621e-02; rel: 1.256e-03; norm: 1.190e+00; mom: 1.415e-01;
## best it: 52; best obj: 1.272e+01
## It: 74; obj: 1.294e+01; abs: 1.658e-02; rel: 1.283e-03; norm: 1.195e+00; mom: 1.382e-01;
## best it: 52; best obj: 1.272e+01
## It: 75; obj: 1.296e+01; abs: 1.699e-02; rel: 1.313e-03; norm: 1.199e+00; mom: 1.287e-01;
## best it: 52; best obj: 1.272e+01

## It: 76; obj: 1.297e+01; abs: 1.760e-02; rel: 1.359e-03; norm: 1.203e+00; mom: 1.209e-01;
## best it: 52; best obj: 1.272e+01
## It: 77; obj: 1.299e+01; abs: 1.821e-02; rel: 1.404e-03; norm: 1.207e+00; mom: 1.123e-01;
## best it: 52; best obj: 1.272e+01
## It: 78; obj: 1.301e+01; abs: 1.894e-02; rel: 1.458e-03; norm: 1.211e+00; mom: 1.098e-01;
## best it: 52; best obj: 1.272e+01
## It: 79; obj: 1.303e+01; abs: 1.964e-02; rel: 1.510e-03; norm: 1.215e+00; mom: 1.116e-01;
## best it: 52; best obj: 1.272e+01
## It: 80; obj: 1.305e+01; abs: 2.048e-02; rel: 1.572e-03; norm: 1.219e+00; mom: 1.139e-01;
## best it: 52; best obj: 1.272e+01
## It: 81; obj: 1.307e+01; abs: 2.133e-02; rel: 1.634e-03; norm: 1.222e+00; mom: 1.170e-01;
## best it: 52; best obj: 1.272e+01
## It: 82; obj: 1.309e+01; abs: 2.231e-02; rel: 1.707e-03; norm: 1.226e+00; mom: 1.207e-01;
## best it: 52; best obj: 1.272e+01
## It: 83; obj: 1.312e+01; abs: 2.329e-02; rel: 1.778e-03; norm: 1.230e+00; mom: 1.256e-01;
## best it: 52; best obj: 1.272e+01
## It: 84; obj: 1.314e+01; abs: 2.434e-02; rel: 1.855e-03; norm: 1.234e+00; mom: 1.316e-01;
## best it: 52; best obj: 1.272e+01
## It: 85; obj: 1.317e+01; abs: 2.542e-02; rel: 1.934e-03; norm: 1.238e+00; mom: 1.396e-01;
## best it: 52; best obj: 1.272e+01
## It: 86; obj: 1.319e+01; abs: 2.649e-02; rel: 2.011e-03; norm: 1.242e+00; mom: 1.505e-01;
## best it: 52; best obj: 1.272e+01
## It: 87; obj: 1.322e+01; abs: 2.775e-02; rel: 2.103e-03; norm: 1.246e+00; mom: 1.644e-01;
## best it: 52; best obj: 1.272e+01

```

```

## It: 88; obj: 1.325e+01; abs: 2.881e-02; rel: 2.179e-03; norm: 1.251e+00; mom: 1.825e-01;
## best it: 52; best obj: 1.272e+01
## It: 89; obj: 1.328e+01; abs: 3.036e-02; rel: 2.292e-03; norm: 1.256e+00; mom: 2.019e-01;
## best it: 52; best obj: 1.272e+01
## It: 90; obj: 1.331e+01; abs: 3.130e-02; rel: 2.357e-03; norm: 1.261e+00; mom: 2.246e-01;
## best it: 52; best obj: 1.272e+01
## It: 91; obj: 1.335e+01; abs: 3.317e-02; rel: 2.492e-03; norm: 1.267e+00; mom: 2.458e-01;
## best it: 52; best obj: 1.272e+01
## It: 92; obj: 1.338e+01; abs: 3.389e-02; rel: 2.539e-03; norm: 1.273e+00; mom: 2.685e-01;
## best it: 52; best obj: 1.272e+01
## It: 93; obj: 1.342e+01; abs: 3.608e-02; rel: 2.697e-03; norm: 1.280e+00; mom: 2.869e-01;
## best it: 52; best obj: 1.272e+01
## It: 94; obj: 1.345e+01; abs: 3.660e-02; rel: 2.728e-03; norm: 1.287e+00; mom: 3.035e-01;
## best it: 52; best obj: 1.272e+01
## It: 95; obj: 1.349e+01; abs: 3.908e-02; rel: 2.906e-03; norm: 1.295e+00; mom: 3.143e-01;
## best it: 52; best obj: 1.272e+01
## It: 96; obj: 1.353e+01; abs: 3.960e-02; rel: 2.935e-03; norm: 1.304e+00; mom: 3.199e-01;
## best it: 52; best obj: 1.272e+01
## It: 97; obj: 1.357e+01; abs: 4.227e-02; rel: 3.124e-03; norm: 1.314e+00; mom: 3.209e-01;
## best it: 52; best obj: 1.272e+01
## It: 98; obj: 1.362e+01; abs: 4.298e-02; rel: 3.167e-03; norm: 1.325e+00; mom: 3.156e-01;
## best it: 52; best obj: 1.272e+01
## It: 99; obj: 1.366e+01; abs: 4.573e-02; rel: 3.359e-03; norm: 1.337e+00; mom: 3.086e-01;
## best it: 52; best obj: 1.272e+01
## It: 100; obj: 1.371e+01; abs: 4.680e-02; rel: 3.425e-03; norm: 1.350e+00; mom: 2.960e-01;
## best it: 52; best obj: 1.272e+01

## It: 101; obj: 2.091e+00; abs: 1.162e+01; rel: 8.475e-01; norm: 1.682e-01; mom: 2.847e-01;
## best it: 101; best obj: 2.091e+00
## It: 102; obj: 2.070e+00; abs: 2.114e-02; rel: 1.011e-02; norm: 1.237e-01; mom: 5.793e+00;
## best it: 102; best obj: 2.070e+00
## It: 103; obj: 2.071e+00; abs: 1.218e-03; rel: 5.884e-04; norm: 1.219e-01; mom: 3.351e+00;
## best it: 102; best obj: 2.070e+00
## It: 104; obj: 2.154e+00; abs: 8.329e-02; rel: 4.022e-02; norm: 1.320e-01; mom: 4.158e+00;
## best it: 102; best obj: 2.070e+00
## It: 105; obj: 2.234e+00; abs: 7.928e-02; rel: 3.680e-02; norm: 1.371e-01; mom: 4.958e+00;
## best it: 102; best obj: 2.070e+00
## It: 106; obj: 2.340e+00; abs: 1.065e-01; rel: 4.767e-02; norm: 1.470e-01; mom: 5.972e+00;
## best it: 102; best obj: 2.070e+00
## It: 107; obj: 2.441e+00; abs: 1.010e-01; rel: 4.317e-02; norm: 1.543e-01; mom: 7.037e+00;
## best it: 102; best obj: 2.070e+00
## It: 108; obj: 2.543e+00; abs: 1.018e-01; rel: 4.171e-02; norm: 1.663e-01; mom: 7.729e+00;
## best it: 102; best obj: 2.070e+00
## It: 109; obj: 2.653e+00; abs: 1.097e-01; rel: 4.313e-02; norm: 1.783e-01; mom: 8.822e+00;
## best it: 102; best obj: 2.070e+00
## It: 110; obj: 2.764e+00; abs: 1.110e-01; rel: 4.185e-02; norm: 2.002e-01; mom: 9.552e+00;
## best it: 102; best obj: 2.070e+00
## It: 111; obj: 2.842e+00; abs: 7.854e-02; rel: 2.842e-02; norm: 2.293e-01; mom: 1.031e+01;
## best it: 102; best obj: 2.070e+00
## It: 112; obj: 2.925e+00; abs: 8.275e-02; rel: 2.911e-02; norm: 2.912e-01; mom: 1.073e+01;
## best it: 102; best obj: 2.070e+00
## It: 113; obj: 2.936e+00; abs: 1.080e-02; rel: 3.692e-03; norm: 3.332e-01; mom: 1.102e+01;
## best it: 102; best obj: 2.070e+00
## It: 114; obj: 3.009e+00; abs: 7.295e-02; rel: 2.485e-02; norm: 3.512e-01; mom: 1.130e+01;

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## best it: 102; best obj: 2.070e+00
## It: 115; obj: 2.996e+00; abs: 1.233e-02; rel: 4.099e-03; norm: 3.772e-01; mom: 1.150e+01;
## best it: 102; best obj: 2.070e+00
## It: 116; obj: 2.984e+00; abs: 1.275e-02; rel: 4.255e-03; norm: 4.037e-01; mom: 1.177e+01;
## best it: 102; best obj: 2.070e+00
## It: 117; obj: 2.983e+00; abs: 8.089e-04; rel: 2.711e-04; norm: 4.071e-01; mom: 1.188e+01;
## best it: 102; best obj: 2.070e+00
## It: 118; obj: 2.993e+00; abs: 1.030e-02; rel: 3.454e-03; norm: 4.145e-01; mom: 1.194e+01;
## best it: 102; best obj: 2.070e+00
## It: 119; obj: 2.953e+00; abs: 4.006e-02; rel: 1.339e-02; norm: 4.277e-01; mom: 1.199e+01;
## best it: 102; best obj: 2.070e+00
## It: 120; obj: 2.916e+00; abs: 3.697e-02; rel: 1.252e-02; norm: 4.312e-01; mom: 1.224e+01;
## best it: 102; best obj: 2.070e+00
## It: 121; obj: 2.943e+00; abs: 2.713e-02; rel: 9.305e-03; norm: 4.329e-01; mom: 1.218e+01;
## best it: 102; best obj: 2.070e+00
## It: 122; obj: 2.908e+00; abs: 3.574e-02; rel: 1.214e-02; norm: 4.514e-01; mom: 1.229e+01;
## best it: 102; best obj: 2.070e+00
## It: 123; obj: 2.899e+00; abs: 8.915e-03; rel: 3.066e-03; norm: 4.601e-01; mom: 1.250e+01;
## best it: 102; best obj: 2.070e+00
## It: 124; obj: 2.868e+00; abs: 3.015e-02; rel: 1.040e-02; norm: 4.662e-01; mom: 1.263e+01;
## best it: 102; best obj: 2.070e+00
## It: 125; obj: 2.847e+00; abs: 2.171e-02; rel: 7.570e-03; norm: 4.703e-01; mom: 1.256e+01;
## best it: 102; best obj: 2.070e+00

## It: 126; obj: 2.798e+00; abs: 4.856e-02; rel: 1.706e-02; norm: 4.719e-01; mom: 1.266e+01;
## best it: 102; best obj: 2.070e+00
## It: 127; obj: 2.788e+00; abs: 1.059e-02; rel: 3.783e-03; norm: 4.725e-01; mom: 1.252e+01;
## best it: 102; best obj: 2.070e+00
## It: 128; obj: 2.739e+00; abs: 4.833e-02; rel: 1.734e-02; norm: 4.776e-01; mom: 1.238e+01;
## best it: 102; best obj: 2.070e+00
## It: 129; obj: 2.695e+00; abs: 4.404e-02; rel: 1.608e-02; norm: 4.776e-01; mom: 1.213e+01;
## best it: 102; best obj: 2.070e+00
## It: 130; obj: 2.664e+00; abs: 3.114e-02; rel: 1.155e-02; norm: 4.765e-01; mom: 1.197e+01;
## best it: 102; best obj: 2.070e+00
## It: 131; obj: 2.610e+00; abs: 5.447e-02; rel: 2.045e-02; norm: 4.685e-01; mom: 1.140e+01;
## best it: 102; best obj: 2.070e+00
## It: 132; obj: 2.641e+00; abs: 3.175e-02; rel: 1.217e-02; norm: 4.715e-01; mom: 1.126e+01;
## best it: 102; best obj: 2.070e+00
## It: 133; obj: 2.598e+00; abs: 4.382e-02; rel: 1.659e-02; norm: 4.762e-01; mom: 1.161e+01;
## best it: 102; best obj: 2.070e+00
## It: 134; obj: 2.622e+00; abs: 2.442e-02; rel: 9.402e-03; norm: 4.679e-01; mom: 1.152e+01;
## best it: 102; best obj: 2.070e+00
## It: 135; obj: 2.583e+00; abs: 3.884e-02; rel: 1.481e-02; norm: 4.688e-01; mom: 1.142e+01;
## best it: 102; best obj: 2.070e+00
## It: 136; obj: 2.575e+00; abs: 8.025e-03; rel: 3.107e-03; norm: 4.727e-01; mom: 1.163e+01;
## best it: 102; best obj: 2.070e+00
## It: 137; obj: 2.548e+00; abs: 2.728e-02; rel: 1.059e-02; norm: 4.714e-01; mom: 1.139e+01;
## best it: 102; best obj: 2.070e+00
## It: 138; obj: 2.556e+00; abs: 8.339e-03; rel: 3.273e-03; norm: 4.800e-01; mom: 1.164e+01;
## best it: 102; best obj: 2.070e+00
## It: 139; obj: 2.508e+00; abs: 4.788e-02; rel: 1.873e-02; norm: 4.774e-01; mom: 1.162e+01;
## best it: 102; best obj: 2.070e+00
## It: 140; obj: 2.562e+00; abs: 5.411e-02; rel: 2.157e-02; norm: 4.739e-01; mom: 1.153e+01;
## best it: 102; best obj: 2.070e+00

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## It: 141; obj: 2.495e+00; abs: 6.785e-02; rel: 2.648e-02; norm: 4.754e-01; mom: 1.158e+01;
## best it: 102; best obj: 2.070e+00
## It: 142; obj: 2.558e+00; abs: 6.332e-02; rel: 2.538e-02; norm: 4.752e-01; mom: 1.161e+01;
## best it: 102; best obj: 2.070e+00
## It: 143; obj: 2.501e+00; abs: 5.673e-02; rel: 2.218e-02; norm: 4.718e-01; mom: 1.165e+01;
## best it: 102; best obj: 2.070e+00
## It: 144; obj: 2.528e+00; abs: 2.714e-02; rel: 1.085e-02; norm: 4.778e-01; mom: 1.164e+01;
## best it: 102; best obj: 2.070e+00
## It: 145; obj: 2.488e+00; abs: 4.062e-02; rel: 1.607e-02; norm: 4.688e-01; mom: 1.151e+01;
## best it: 102; best obj: 2.070e+00
## It: 146; obj: 2.539e+00; abs: 5.130e-02; rel: 2.062e-02; norm: 4.765e-01; mom: 1.153e+01;
## best it: 102; best obj: 2.070e+00
## It: 147; obj: 2.489e+00; abs: 4.974e-02; rel: 1.959e-02; norm: 4.769e-01; mom: 1.161e+01;
## best it: 102; best obj: 2.070e+00
## It: 148; obj: 2.511e+00; abs: 2.198e-02; rel: 8.831e-03; norm: 4.816e-01; mom: 1.163e+01;
## best it: 102; best obj: 2.070e+00
## It: 149; obj: 2.461e+00; abs: 5.053e-02; rel: 2.012e-02; norm: 4.775e-01; mom: 1.168e+01;
## best it: 102; best obj: 2.070e+00
## It: 150; obj: 2.509e+00; abs: 4.816e-02; rel: 1.957e-02; norm: 4.768e-01; mom: 1.165e+01;
## best it: 102; best obj: 2.070e+00

## It: 151; obj: 2.456e+00; abs: 5.253e-02; rel: 2.094e-02; norm: 4.747e-01; mom: 1.162e+01;
## best it: 102; best obj: 2.070e+00
## It: 152; obj: 2.495e+00; abs: 3.864e-02; rel: 1.573e-02; norm: 4.753e-01; mom: 1.166e+01;
## best it: 102; best obj: 2.070e+00
## It: 153; obj: 2.454e+00; abs: 4.063e-02; rel: 1.629e-02; norm: 4.702e-01; mom: 1.165e+01;
## best it: 102; best obj: 2.070e+00
## It: 154; obj: 2.479e+00; abs: 2.446e-02; rel: 9.964e-03; norm: 4.709e-01; mom: 1.158e+01;
## best it: 102; best obj: 2.070e+00
## It: 155; obj: 2.445e+00; abs: 3.422e-02; rel: 1.381e-02; norm: 4.657e-01; mom: 1.148e+01;
## best it: 102; best obj: 2.070e+00
## It: 156; obj: 2.496e+00; abs: 5.106e-02; rel: 2.089e-02; norm: 4.645e-01; mom: 1.141e+01;
## best it: 102; best obj: 2.070e+00
## It: 157; obj: 2.434e+00; abs: 6.154e-02; rel: 2.466e-02; norm: 4.623e-01; mom: 1.146e+01;
## best it: 102; best obj: 2.070e+00
## It: 158; obj: 2.484e+00; abs: 4.958e-02; rel: 2.037e-02; norm: 4.612e-01; mom: 1.136e+01;
## best it: 102; best obj: 2.070e+00
## It: 159; obj: 2.433e+00; abs: 5.079e-02; rel: 2.045e-02; norm: 4.555e-01; mom: 1.125e+01;
## best it: 102; best obj: 2.070e+00
## It: 160; obj: 2.503e+00; abs: 7.035e-02; rel: 2.891e-02; norm: 4.583e-01; mom: 1.125e+01;
## best it: 102; best obj: 2.070e+00
## It: 161; obj: 2.440e+00; abs: 6.371e-02; rel: 2.545e-02; norm: 4.591e-01; mom: 1.128e+01;
## best it: 102; best obj: 2.070e+00
## It: 162; obj: 2.504e+00; abs: 6.433e-02; rel: 2.637e-02; norm: 4.657e-01; mom: 1.128e+01;
## best it: 102; best obj: 2.070e+00
## It: 163; obj: 2.434e+00; abs: 6.956e-02; rel: 2.778e-02; norm: 4.650e-01; mom: 1.123e+01;
## best it: 102; best obj: 2.070e+00
## It: 164; obj: 2.467e+00; abs: 3.252e-02; rel: 1.336e-02; norm: 4.717e-01; mom: 1.131e+01;
## best it: 102; best obj: 2.070e+00
## It: 165; obj: 2.414e+00; abs: 5.312e-02; rel: 2.153e-02; norm: 4.614e-01; mom: 1.126e+01;
## best it: 102; best obj: 2.070e+00
## It: 166; obj: 2.465e+00; abs: 5.089e-02; rel: 2.108e-02; norm: 4.599e-01; mom: 1.129e+01;
## best it: 102; best obj: 2.070e+00
## It: 167; obj: 2.431e+00; abs: 3.387e-02; rel: 1.374e-02; norm: 4.536e-01; mom: 1.125e+01;

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## best it: 102; best obj: 2.070e+00
## It: 168; obj: 2.472e+00; abs: 4.128e-02; rel: 1.698e-02; norm: 4.574e-01; mom: 1.109e+01;
## best it: 102; best obj: 2.070e+00
## It: 169; obj: 2.426e+00; abs: 4.564e-02; rel: 1.846e-02; norm: 4.537e-01; mom: 1.119e+01;
## best it: 102; best obj: 2.070e+00
## It: 170; obj: 2.464e+00; abs: 3.732e-02; rel: 1.538e-02; norm: 4.599e-01; mom: 1.116e+01;
## best it: 102; best obj: 2.070e+00
## It: 171; obj: 2.395e+00; abs: 6.821e-02; rel: 2.769e-02; norm: 4.536e-01; mom: 1.117e+01;
## best it: 102; best obj: 2.070e+00
## It: 172; obj: 2.460e+00; abs: 6.425e-02; rel: 2.682e-02; norm: 4.546e-01; mom: 1.114e+01;
## best it: 102; best obj: 2.070e+00
## It: 173; obj: 2.396e+00; abs: 6.381e-02; rel: 2.594e-02; norm: 4.491e-01; mom: 1.102e+01;
## best it: 102; best obj: 2.070e+00
## It: 174; obj: 2.458e+00; abs: 6.253e-02; rel: 2.610e-02; norm: 4.521e-01; mom: 1.106e+01;
## best it: 102; best obj: 2.070e+00
## It: 175; obj: 2.393e+00; abs: 6.566e-02; rel: 2.671e-02; norm: 4.476e-01; mom: 1.110e+01;
## best it: 102; best obj: 2.070e+00

## It: 176; obj: 2.446e+00; abs: 5.335e-02; rel: 2.230e-02; norm: 4.527e-01; mom: 1.113e+01;
## best it: 102; best obj: 2.070e+00
## It: 177; obj: 2.416e+00; abs: 2.976e-02; rel: 1.217e-02; norm: 4.431e-01; mom: 1.111e+01;
## best it: 102; best obj: 2.070e+00
## It: 178; obj: 2.436e+00; abs: 1.987e-02; rel: 8.223e-03; norm: 4.490e-01; mom: 1.107e+01;
## best it: 102; best obj: 2.070e+00
## It: 179; obj: 2.415e+00; abs: 2.086e-02; rel: 8.561e-03; norm: 4.422e-01; mom: 1.098e+01;
## best it: 102; best obj: 2.070e+00
## It: 180; obj: 2.452e+00; abs: 3.619e-02; rel: 1.498e-02; norm: 4.497e-01; mom: 1.095e+01;
## best it: 102; best obj: 2.070e+00
## It: 181; obj: 2.393e+00; abs: 5.884e-02; rel: 2.400e-02; norm: 4.478e-01; mom: 1.110e+01;
## best it: 102; best obj: 2.070e+00
## It: 182; obj: 2.446e+00; abs: 5.351e-02; rel: 2.236e-02; norm: 4.481e-01; mom: 1.100e+01;
## best it: 102; best obj: 2.070e+00
## It: 183; obj: 2.421e+00; abs: 2.514e-02; rel: 1.028e-02; norm: 4.433e-01; mom: 1.103e+01;
## best it: 102; best obj: 2.070e+00
## It: 184; obj: 2.469e+00; abs: 4.761e-02; rel: 1.966e-02; norm: 4.500e-01; mom: 1.107e+01;
## best it: 102; best obj: 2.070e+00
## It: 185; obj: 2.414e+00; abs: 5.491e-02; rel: 2.224e-02; norm: 4.453e-01; mom: 1.100e+01;
## best it: 102; best obj: 2.070e+00
## It: 186; obj: 2.483e+00; abs: 6.912e-02; rel: 2.864e-02; norm: 4.509e-01; mom: 1.102e+01;
## best it: 102; best obj: 2.070e+00
## It: 187; obj: 2.403e+00; abs: 7.951e-02; rel: 3.202e-02; norm: 4.501e-01; mom: 1.104e+01;
## best it: 102; best obj: 2.070e+00
## It: 188; obj: 2.450e+00; abs: 4.696e-02; rel: 1.954e-02; norm: 4.552e-01; mom: 1.108e+01;
## best it: 102; best obj: 2.070e+00
## It: 189; obj: 2.412e+00; abs: 3.811e-02; rel: 1.555e-02; norm: 4.453e-01; mom: 1.100e+01;
## best it: 102; best obj: 2.070e+00
## It: 190; obj: 2.449e+00; abs: 3.703e-02; rel: 1.535e-02; norm: 4.529e-01; mom: 1.113e+01;
## best it: 102; best obj: 2.070e+00
## It: 191; obj: 2.405e+00; abs: 4.405e-02; rel: 1.798e-02; norm: 4.470e-01; mom: 1.110e+01;
## best it: 102; best obj: 2.070e+00
## It: 192; obj: 2.466e+00; abs: 6.120e-02; rel: 2.544e-02; norm: 4.534e-01; mom: 1.107e+01;
## best it: 102; best obj: 2.070e+00
## It: 193; obj: 2.440e+00; abs: 2.631e-02; rel: 1.067e-02; norm: 4.506e-01; mom: 1.107e+01;
## best it: 102; best obj: 2.070e+00

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## It: 194; obj: 2.459e+00; abs: 1.879e-02; rel: 7.699e-03; norm: 4.573e-01; mom: 1.116e+01;
## best it: 102; best obj: 2.070e+00
## It: 195; obj: 2.408e+00; abs: 5.085e-02; rel: 2.068e-02; norm: 4.533e-01; mom: 1.115e+01;
## best it: 102; best obj: 2.070e+00
## It: 196; obj: 2.462e+00; abs: 5.424e-02; rel: 2.252e-02; norm: 4.582e-01; mom: 1.119e+01;
## best it: 102; best obj: 2.070e+00
## It: 197; obj: 2.406e+00; abs: 5.623e-02; rel: 2.284e-02; norm: 4.534e-01; mom: 1.122e+01;
## best it: 102; best obj: 2.070e+00
## It: 198; obj: 2.448e+00; abs: 4.154e-02; rel: 1.726e-02; norm: 4.551e-01; mom: 1.126e+01;
## best it: 102; best obj: 2.070e+00
## It: 199; obj: 2.412e+00; abs: 3.591e-02; rel: 1.467e-02; norm: 4.471e-01; mom: 1.111e+01;
## best it: 102; best obj: 2.070e+00
## It: 200; obj: 2.465e+00; abs: 5.336e-02; rel: 2.213e-02; norm: 4.544e-01; mom: 1.112e+01;
## best it: 102; best obj: 2.070e+00

## It: 201; obj: 2.422e+00; abs: 4.269e-02; rel: 1.732e-02; norm: 4.548e-01; mom: 1.108e+01;
## best it: 102; best obj: 2.070e+00
## It: 202; obj: 2.456e+00; abs: 3.406e-02; rel: 1.406e-02; norm: 4.614e-01; mom: 1.112e+01;
## best it: 102; best obj: 2.070e+00
## It: 203; obj: 2.432e+00; abs: 2.484e-02; rel: 1.011e-02; norm: 4.568e-01; mom: 1.110e+01;
## best it: 102; best obj: 2.070e+00
## It: 204; obj: 2.446e+00; abs: 1.425e-02; rel: 5.862e-03; norm: 4.649e-01; mom: 1.114e+01;
## best it: 102; best obj: 2.070e+00
## It: 205; obj: 2.422e+00; abs: 2.370e-02; rel: 9.691e-03; norm: 4.544e-01; mom: 1.112e+01;
## best it: 102; best obj: 2.070e+00
## It: 206; obj: 2.457e+00; abs: 3.510e-02; rel: 1.449e-02; norm: 4.600e-01; mom: 1.112e+01;
## best it: 102; best obj: 2.070e+00
## It: 207; obj: 2.411e+00; abs: 4.577e-02; rel: 1.863e-02; norm: 4.558e-01; mom: 1.124e+01;
## best it: 102; best obj: 2.070e+00
## It: 208; obj: 2.462e+00; abs: 5.094e-02; rel: 2.112e-02; norm: 4.599e-01; mom: 1.120e+01;
## best it: 102; best obj: 2.070e+00
## It: 209; obj: 2.415e+00; abs: 4.784e-02; rel: 1.943e-02; norm: 4.556e-01; mom: 1.124e+01;
## best it: 102; best obj: 2.070e+00
## It: 210; obj: 2.445e+00; abs: 3.080e-02; rel: 1.275e-02; norm: 4.585e-01; mom: 1.117e+01;
## best it: 102; best obj: 2.070e+00
## It: 211; obj: 2.397e+00; abs: 4.872e-02; rel: 1.992e-02; norm: 4.535e-01; mom: 1.112e+01;
## best it: 102; best obj: 2.070e+00
## It: 212; obj: 2.448e+00; abs: 5.148e-02; rel: 2.148e-02; norm: 4.585e-01; mom: 1.111e+01;
## best it: 102; best obj: 2.070e+00
## It: 213; obj: 2.407e+00; abs: 4.124e-02; rel: 1.685e-02; norm: 4.528e-01; mom: 1.108e+01;
## best it: 102; best obj: 2.070e+00
## It: 214; obj: 2.443e+00; abs: 3.621e-02; rel: 1.504e-02; norm: 4.586e-01; mom: 1.112e+01;
## best it: 102; best obj: 2.070e+00
## It: 215; obj: 2.396e+00; abs: 4.681e-02; rel: 1.916e-02; norm: 4.506e-01; mom: 1.110e+01;
## best it: 102; best obj: 2.070e+00
## It: 216; obj: 2.446e+00; abs: 4.967e-02; rel: 2.073e-02; norm: 4.551e-01; mom: 1.108e+01;
## best it: 102; best obj: 2.070e+00
## It: 217; obj: 2.405e+00; abs: 4.094e-02; rel: 1.674e-02; norm: 4.485e-01; mom: 1.104e+01;
## best it: 102; best obj: 2.070e+00
## It: 218; obj: 2.457e+00; abs: 5.151e-02; rel: 2.142e-02; norm: 4.572e-01; mom: 1.107e+01;
## best it: 102; best obj: 2.070e+00
## It: 219; obj: 2.408e+00; abs: 4.858e-02; rel: 1.977e-02; norm: 4.529e-01; mom: 1.109e+01;
## best it: 102; best obj: 2.070e+00
## It: 220; obj: 2.446e+00; abs: 3.781e-02; rel: 1.570e-02; norm: 4.565e-01; mom: 1.108e+01;

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## best it: 102; best obj: 2.070e+00
## It: 221; obj: 2.419e+00; abs: 2.630e-02; rel: 1.075e-02; norm: 4.496e-01; mom: 1.106e+01;
## best it: 102; best obj: 2.070e+00
## It: 222; obj: 2.457e+00; abs: 3.745e-02; rel: 1.548e-02; norm: 4.585e-01; mom: 1.105e+01;
## best it: 102; best obj: 2.070e+00
## It: 223; obj: 2.418e+00; abs: 3.868e-02; rel: 1.574e-02; norm: 4.533e-01; mom: 1.105e+01;
## best it: 102; best obj: 2.070e+00
## It: 224; obj: 2.463e+00; abs: 4.456e-02; rel: 1.843e-02; norm: 4.570e-01; mom: 1.105e+01;
## best it: 102; best obj: 2.070e+00
## It: 225; obj: 2.435e+00; abs: 2.745e-02; rel: 1.115e-02; norm: 4.534e-01; mom: 1.106e+01;
## best it: 102; best obj: 2.070e+00

## It: 226; obj: 2.472e+00; abs: 3.707e-02; rel: 1.522e-02; norm: 4.595e-01; mom: 1.115e+01;
## best it: 102; best obj: 2.070e+00
## It: 227; obj: 2.428e+00; abs: 4.437e-02; rel: 1.794e-02; norm: 4.525e-01; mom: 1.109e+01;
## best it: 102; best obj: 2.070e+00
## It: 228; obj: 2.469e+00; abs: 4.084e-02; rel: 1.682e-02; norm: 4.554e-01; mom: 1.111e+01;
## best it: 102; best obj: 2.070e+00
## It: 229; obj: 2.432e+00; abs: 3.720e-02; rel: 1.507e-02; norm: 4.555e-01; mom: 1.114e+01;
## best it: 102; best obj: 2.070e+00
## It: 230; obj: 2.464e+00; abs: 3.259e-02; rel: 1.340e-02; norm: 4.633e-01; mom: 1.110e+01;
## best it: 102; best obj: 2.070e+00
## It: 231; obj: 2.416e+00; abs: 4.862e-02; rel: 1.973e-02; norm: 4.604e-01; mom: 1.115e+01;
## best it: 102; best obj: 2.070e+00
## It: 232; obj: 2.454e+00; abs: 3.824e-02; rel: 1.583e-02; norm: 4.615e-01; mom: 1.109e+01;
## best it: 102; best obj: 2.070e+00
## It: 233; obj: 2.423e+00; abs: 3.120e-02; rel: 1.271e-02; norm: 4.588e-01; mom: 1.111e+01;
## best it: 102; best obj: 2.070e+00
## It: 234; obj: 2.445e+00; abs: 2.250e-02; rel: 9.287e-03; norm: 4.645e-01; mom: 1.112e+01;
## best it: 102; best obj: 2.070e+00
## It: 235; obj: 2.414e+00; abs: 3.097e-02; rel: 1.266e-02; norm: 4.594e-01; mom: 1.114e+01;
## best it: 102; best obj: 2.070e+00
## It: 236; obj: 2.447e+00; abs: 3.275e-02; rel: 1.357e-02; norm: 4.618e-01; mom: 1.112e+01;
## best it: 102; best obj: 2.070e+00
## It: 237; obj: 2.406e+00; abs: 4.073e-02; rel: 1.664e-02; norm: 4.572e-01; mom: 1.117e+01;
## best it: 102; best obj: 2.070e+00
## It: 238; obj: 2.445e+00; abs: 3.848e-02; rel: 1.599e-02; norm: 4.595e-01; mom: 1.111e+01;
## best it: 102; best obj: 2.070e+00
## It: 239; obj: 2.409e+00; abs: 3.621e-02; rel: 1.481e-02; norm: 4.541e-01; mom: 1.111e+01;
## best it: 102; best obj: 2.070e+00
## It: 240; obj: 2.450e+00; abs: 4.126e-02; rel: 1.713e-02; norm: 4.596e-01; mom: 1.108e+01;
## best it: 102; best obj: 2.070e+00
## It: 241; obj: 2.417e+00; abs: 3.251e-02; rel: 1.327e-02; norm: 4.529e-01; mom: 1.113e+01;
## best it: 102; best obj: 2.070e+00
## It: 242; obj: 2.445e+00; abs: 2.796e-02; rel: 1.157e-02; norm: 4.604e-01; mom: 1.116e+01;
## best it: 102; best obj: 2.070e+00
## It: 243; obj: 2.414e+00; abs: 3.099e-02; rel: 1.267e-02; norm: 4.536e-01; mom: 1.112e+01;
## best it: 102; best obj: 2.070e+00
## It: 244; obj: 2.456e+00; abs: 4.153e-02; rel: 1.720e-02; norm: 4.592e-01; mom: 1.108e+01;
## best it: 102; best obj: 2.070e+00
## It: 245; obj: 2.414e+00; abs: 4.130e-02; rel: 1.682e-02; norm: 4.547e-01; mom: 1.114e+01;
## best it: 102; best obj: 2.070e+00
## It: 246; obj: 2.455e+00; abs: 4.078e-02; rel: 1.689e-02; norm: 4.615e-01; mom: 1.113e+01;
## best it: 102; best obj: 2.070e+00

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## It: 247; obj: 2.422e+00; abs: 3.286e-02; rel: 1.339e-02; norm: 4.555e-01; mom: 1.109e+01;
## best it: 102; best obj: 2.070e+00
## It: 248; obj: 2.433e+00; abs: 1.074e-02; rel: 4.434e-03; norm: 4.614e-01; mom: 1.776e+01;
## best it: 102; best obj: 2.070e+00
## It: 249; obj: 2.395e+00; abs: 3.855e-02; rel: 1.585e-02; norm: 4.462e-01; mom: 1.769e+01;
## best it: 102; best obj: 2.070e+00
## It: 250; obj: 2.423e+00; abs: 2.795e-02; rel: 1.167e-02; norm: 4.470e-01; mom: 1.764e+01;
## best it: 102; best obj: 2.070e+00

## It: 251; obj: 2.377e+00; abs: 4.584e-02; rel: 1.892e-02; norm: 4.345e-01; mom: 1.758e+01;
## best it: 102; best obj: 2.070e+00
## It: 252; obj: 2.423e+00; abs: 4.623e-02; rel: 1.945e-02; norm: 4.365e-01; mom: 1.753e+01;
## best it: 102; best obj: 2.070e+00
## It: 253; obj: 2.379e+00; abs: 4.350e-02; rel: 1.796e-02; norm: 4.273e-01; mom: 1.750e+01;
## best it: 102; best obj: 2.070e+00
## It: 254; obj: 2.405e+00; abs: 2.580e-02; rel: 1.084e-02; norm: 4.332e-01; mom: 1.748e+01;
## best it: 102; best obj: 2.070e+00
## It: 255; obj: 2.358e+00; abs: 4.708e-02; rel: 1.958e-02; norm: 4.210e-01; mom: 1.733e+01;
## best it: 102; best obj: 2.070e+00
## It: 256; obj: 2.398e+00; abs: 3.972e-02; rel: 1.685e-02; norm: 4.201e-01; mom: 1.728e+01;
## best it: 102; best obj: 2.070e+00
## It: 257; obj: 2.357e+00; abs: 4.109e-02; rel: 1.713e-02; norm: 4.058e-01; mom: 1.728e+01;
## best it: 102; best obj: 2.070e+00
## It: 258; obj: 2.390e+00; abs: 3.326e-02; rel: 1.411e-02; norm: 4.171e-01; mom: 1.709e+01;
## best it: 102; best obj: 2.070e+00
## It: 259; obj: 2.345e+00; abs: 4.527e-02; rel: 1.894e-02; norm: 4.046e-01; mom: 1.697e+01;
## best it: 102; best obj: 2.070e+00
## It: 260; obj: 2.366e+00; abs: 2.141e-02; rel: 9.133e-03; norm: 4.149e-01; mom: 1.690e+01;
## best it: 102; best obj: 2.070e+00
## It: 261; obj: 2.340e+00; abs: 2.618e-02; rel: 1.106e-02; norm: 4.070e-01; mom: 1.688e+01;
## best it: 102; best obj: 2.070e+00
## It: 262; obj: 2.350e+00; abs: 1.013e-02; rel: 4.327e-03; norm: 4.134e-01; mom: 1.689e+01;
## best it: 102; best obj: 2.070e+00
## It: 263; obj: 2.317e+00; abs: 3.316e-02; rel: 1.411e-02; norm: 4.037e-01; mom: 1.668e+01;
## best it: 102; best obj: 2.070e+00
## It: 264; obj: 2.338e+00; abs: 2.104e-02; rel: 9.079e-03; norm: 4.049e-01; mom: 1.665e+01;
## best it: 102; best obj: 2.070e+00
## It: 265; obj: 2.316e+00; abs: 2.203e-02; rel: 9.424e-03; norm: 3.976e-01; mom: 1.663e+01;
## best it: 102; best obj: 2.070e+00
## It: 266; obj: 2.312e+00; abs: 4.288e-03; rel: 1.851e-03; norm: 4.032e-01; mom: 1.659e+01;
## best it: 102; best obj: 2.070e+00
## It: 267; obj: 2.293e+00; abs: 1.832e-02; rel: 7.924e-03; norm: 3.920e-01; mom: 1.648e+01;
## best it: 102; best obj: 2.070e+00
## It: 268; obj: 2.309e+00; abs: 1.602e-02; rel: 6.986e-03; norm: 3.942e-01; mom: 1.636e+01;
## best it: 102; best obj: 2.070e+00
## It: 269; obj: 2.305e+00; abs: 4.268e-03; rel: 1.848e-03; norm: 3.825e-01; mom: 1.634e+01;
## best it: 102; best obj: 2.070e+00
## It: 270; obj: 2.307e+00; abs: 1.401e-03; rel: 6.076e-04; norm: 3.878e-01; mom: 1.613e+01;
## best it: 102; best obj: 2.070e+00
## It: 271; obj: 2.271e+00; abs: 3.511e-02; rel: 1.522e-02; norm: 3.855e-01; mom: 1.618e+01;
## best it: 102; best obj: 2.070e+00
## It: 272; obj: 2.297e+00; abs: 2.578e-02; rel: 1.135e-02; norm: 3.873e-01; mom: 1.607e+01;
## best it: 102; best obj: 2.070e+00
## It: 273; obj: 2.296e+00; abs: 8.920e-04; rel: 3.883e-04; norm: 3.802e-01; mom: 1.611e+01;

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## best it: 102; best obj: 2.070e+00
## It: 274; obj: 2.285e+00; abs: 1.132e-02; rel: 4.930e-03; norm: 3.842e-01; mom: 1.620e+01;
## best it: 102; best obj: 2.070e+00
## It: 275; obj: 2.274e+00; abs: 1.085e-02; rel: 4.749e-03; norm: 3.815e-01; mom: 1.598e+01;
## best it: 102; best obj: 2.070e+00

## It: 276; obj: 2.289e+00; abs: 1.488e-02; rel: 6.544e-03; norm: 3.894e-01; mom: 1.619e+01;
## best it: 102; best obj: 2.070e+00
## It: 277; obj: 2.282e+00; abs: 6.554e-03; rel: 2.863e-03; norm: 3.817e-01; mom: 1.608e+01;
## best it: 102; best obj: 2.070e+00
## It: 278; obj: 2.290e+00; abs: 7.347e-03; rel: 3.219e-03; norm: 3.838e-01; mom: 1.602e+01;
## best it: 102; best obj: 2.070e+00
## It: 279; obj: 2.289e+00; abs: 1.107e-03; rel: 4.834e-04; norm: 3.770e-01; mom: 1.603e+01;
## best it: 102; best obj: 2.070e+00
## It: 280; obj: 2.296e+00; abs: 7.154e-03; rel: 3.126e-03; norm: 3.797e-01; mom: 1.604e+01;
## best it: 102; best obj: 2.070e+00
## It: 281; obj: 2.285e+00; abs: 1.093e-02; rel: 4.759e-03; norm: 3.694e-01; mom: 1.619e+01;
## best it: 102; best obj: 2.070e+00
## It: 282; obj: 2.287e+00; abs: 1.683e-03; rel: 7.368e-04; norm: 3.731e-01; mom: 1.585e+01;
## best it: 102; best obj: 2.070e+00
## It: 283; obj: 2.283e+00; abs: 3.733e-03; rel: 1.632e-03; norm: 3.711e-01; mom: 1.593e+01;
## best it: 102; best obj: 2.070e+00
## It: 284; obj: 2.294e+00; abs: 1.128e-02; rel: 4.942e-03; norm: 3.817e-01; mom: 1.593e+01;
## best it: 102; best obj: 2.070e+00
## It: 285; obj: 2.305e+00; abs: 1.127e-02; rel: 4.911e-03; norm: 3.759e-01; mom: 1.631e+01;
## best it: 102; best obj: 2.070e+00
## It: 286; obj: 2.320e+00; abs: 1.425e-02; rel: 6.181e-03; norm: 3.803e-01; mom: 1.592e+01;
## best it: 102; best obj: 2.070e+00
## It: 287; obj: 2.284e+00; abs: 3.544e-02; rel: 1.528e-02; norm: 3.733e-01; mom: 1.608e+01;
## best it: 102; best obj: 2.070e+00
## It: 288; obj: 2.325e+00; abs: 4.082e-02; rel: 1.787e-02; norm: 3.812e-01; mom: 1.597e+01;
## best it: 102; best obj: 2.070e+00
## It: 289; obj: 2.286e+00; abs: 3.944e-02; rel: 1.697e-02; norm: 3.807e-01; mom: 1.629e+01;
## best it: 102; best obj: 2.070e+00
## It: 290; obj: 2.305e+00; abs: 1.917e-02; rel: 8.387e-03; norm: 3.947e-01; mom: 1.621e+01;
## best it: 102; best obj: 2.070e+00
## It: 291; obj: 2.297e+00; abs: 7.947e-03; rel: 3.448e-03; norm: 3.835e-01; mom: 1.622e+01;
## best it: 102; best obj: 2.070e+00
## It: 292; obj: 2.293e+00; abs: 3.695e-03; rel: 1.609e-03; norm: 3.918e-01; mom: 1.624e+01;
## best it: 102; best obj: 2.070e+00
## It: 293; obj: 2.280e+00; abs: 1.341e-02; rel: 5.849e-03; norm: 3.832e-01; mom: 1.617e+01;
## best it: 102; best obj: 2.070e+00
## It: 294; obj: 2.304e+00; abs: 2.404e-02; rel: 1.055e-02; norm: 3.857e-01; mom: 1.616e+01;
## best it: 102; best obj: 2.070e+00
## It: 295; obj: 2.276e+00; abs: 2.730e-02; rel: 1.185e-02; norm: 3.834e-01; mom: 1.615e+01;
## best it: 102; best obj: 2.070e+00
## It: 296; obj: 2.296e+00; abs: 1.911e-02; rel: 8.393e-03; norm: 3.930e-01; mom: 1.624e+01;
## best it: 102; best obj: 2.070e+00
## It: 297; obj: 2.286e+00; abs: 9.794e-03; rel: 4.266e-03; norm: 3.831e-01; mom: 1.645e+01;
## best it: 102; best obj: 2.070e+00
## It: 298; obj: 2.295e+00; abs: 8.919e-03; rel: 3.902e-03; norm: 3.876e-01; mom: 1.636e+01;
## best it: 102; best obj: 2.070e+00
## It: 299; obj: 2.283e+00; abs: 1.186e-02; rel: 5.170e-03; norm: 3.816e-01; mom: 1.624e+01;
## best it: 102; best obj: 2.070e+00

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## It: 300; obj: 2.289e+00; abs: 6.290e-03; rel: 2.755e-03; norm: 3.887e-01; mom: 1.632e+01;
## best it: 102; best obj: 2.070e+00

## It: 301; obj: 2.268e+00; abs: 2.076e-02; rel: 9.071e-03; norm: 3.833e-01; mom: 1.618e+01;
## best it: 102; best obj: 2.070e+00

## It: 302; obj: 2.262e+00; abs: 6.802e-03; rel: 2.999e-03; norm: 3.863e-01; mom: 1.617e+01;
## best it: 102; best obj: 2.070e+00

## It: 303; obj: 2.280e+00; abs: 1.891e-02; rel: 8.362e-03; norm: 3.755e-01; mom: 1.613e+01;
## best it: 102; best obj: 2.070e+00

## It: 304; obj: 2.277e+00; abs: 3.279e-03; rel: 1.438e-03; norm: 3.756e-01; mom: 1.604e+01;
## best it: 102; best obj: 2.070e+00

## It: 305; obj: 2.269e+00; abs: 8.413e-03; rel: 3.695e-03; norm: 3.784e-01; mom: 1.619e+01;
## best it: 102; best obj: 2.070e+00

## It: 306; obj: 2.288e+00; abs: 1.930e-02; rel: 8.505e-03; norm: 3.834e-01; mom: 1.604e+01;
## best it: 102; best obj: 2.070e+00

## It: 307; obj: 2.267e+00; abs: 2.124e-02; rel: 9.285e-03; norm: 3.780e-01; mom: 1.628e+01;
## best it: 102; best obj: 2.070e+00

## It: 308; obj: 2.268e+00; abs: 1.397e-03; rel: 6.165e-04; norm: 3.790e-01; mom: 1.600e+01;
## best it: 102; best obj: 2.070e+00

## It: 309; obj: 2.257e+00; abs: 1.128e-02; rel: 4.972e-03; norm: 3.741e-01; mom: 1.599e+01;
## best it: 102; best obj: 2.070e+00

## It: 310; obj: 2.256e+00; abs: 1.125e-03; rel: 4.984e-04; norm: 3.750e-01; mom: 1.611e+01;
## best it: 102; best obj: 2.070e+00

## It: 311; obj: 2.262e+00; abs: 6.603e-03; rel: 2.927e-03; norm: 3.648e-01; mom: 1.597e+01;
## best it: 102; best obj: 2.070e+00

## It: 312; obj: 2.268e+00; abs: 5.592e-03; rel: 2.472e-03; norm: 3.699e-01; mom: 1.588e+01;
## best it: 102; best obj: 2.070e+00

## It: 313; obj: 2.262e+00; abs: 5.570e-03; rel: 2.456e-03; norm: 3.757e-01; mom: 1.601e+01;
## best it: 102; best obj: 2.070e+00

## It: 314; obj: 2.264e+00; abs: 1.816e-03; rel: 8.025e-04; norm: 3.784e-01; mom: 1.589e+01;
## best it: 102; best obj: 2.070e+00

## It: 315; obj: 2.270e+00; abs: 5.305e-03; rel: 2.343e-03; norm: 3.700e-01; mom: 1.601e+01;
## best it: 102; best obj: 2.070e+00

## It: 316; obj: 2.277e+00; abs: 7.769e-03; rel: 3.423e-03; norm: 3.706e-01; mom: 1.600e+01;
## best it: 102; best obj: 2.070e+00

## It: 317; obj: 2.255e+00; abs: 2.271e-02; rel: 9.973e-03; norm: 3.708e-01; mom: 1.607e+01;
## best it: 102; best obj: 2.070e+00

## It: 318; obj: 2.283e+00; abs: 2.800e-02; rel: 1.242e-02; norm: 3.683e-01; mom: 1.594e+01;
## best it: 102; best obj: 2.070e+00

## It: 319; obj: 2.264e+00; abs: 1.900e-02; rel: 8.322e-03; norm: 3.646e-01; mom: 1.586e+01;
## best it: 102; best obj: 2.070e+00

## It: 320; obj: 2.272e+00; abs: 8.342e-03; rel: 3.685e-03; norm: 3.753e-01; mom: 1.585e+01;
## best it: 102; best obj: 2.070e+00

## It: 321; obj: 2.280e+00; abs: 8.499e-03; rel: 3.741e-03; norm: 3.793e-01; mom: 1.590e+01;
## best it: 102; best obj: 2.070e+00

## It: 322; obj: 2.273e+00; abs: 7.037e-03; rel: 3.086e-03; norm: 3.910e-01; mom: 1.633e+01;
## best it: 102; best obj: 2.070e+00

## It: 323; obj: 2.287e+00; abs: 1.381e-02; rel: 6.077e-03; norm: 3.872e-01; mom: 1.625e+01;
## best it: 102; best obj: 2.070e+00

## It: 324; obj: 2.284e+00; abs: 3.617e-03; rel: 1.581e-03; norm: 3.838e-01; mom: 1.615e+01;
## best it: 102; best obj: 2.070e+00

## It: 325; obj: 2.293e+00; abs: 9.758e-03; rel: 4.273e-03; norm: 3.819e-01; mom: 1.629e+01;
## best it: 102; best obj: 2.070e+00

## It: 326; obj: 2.300e+00; abs: 6.380e-03; rel: 2.782e-03; norm: 3.829e-01; mom: 1.615e+01;

```

```

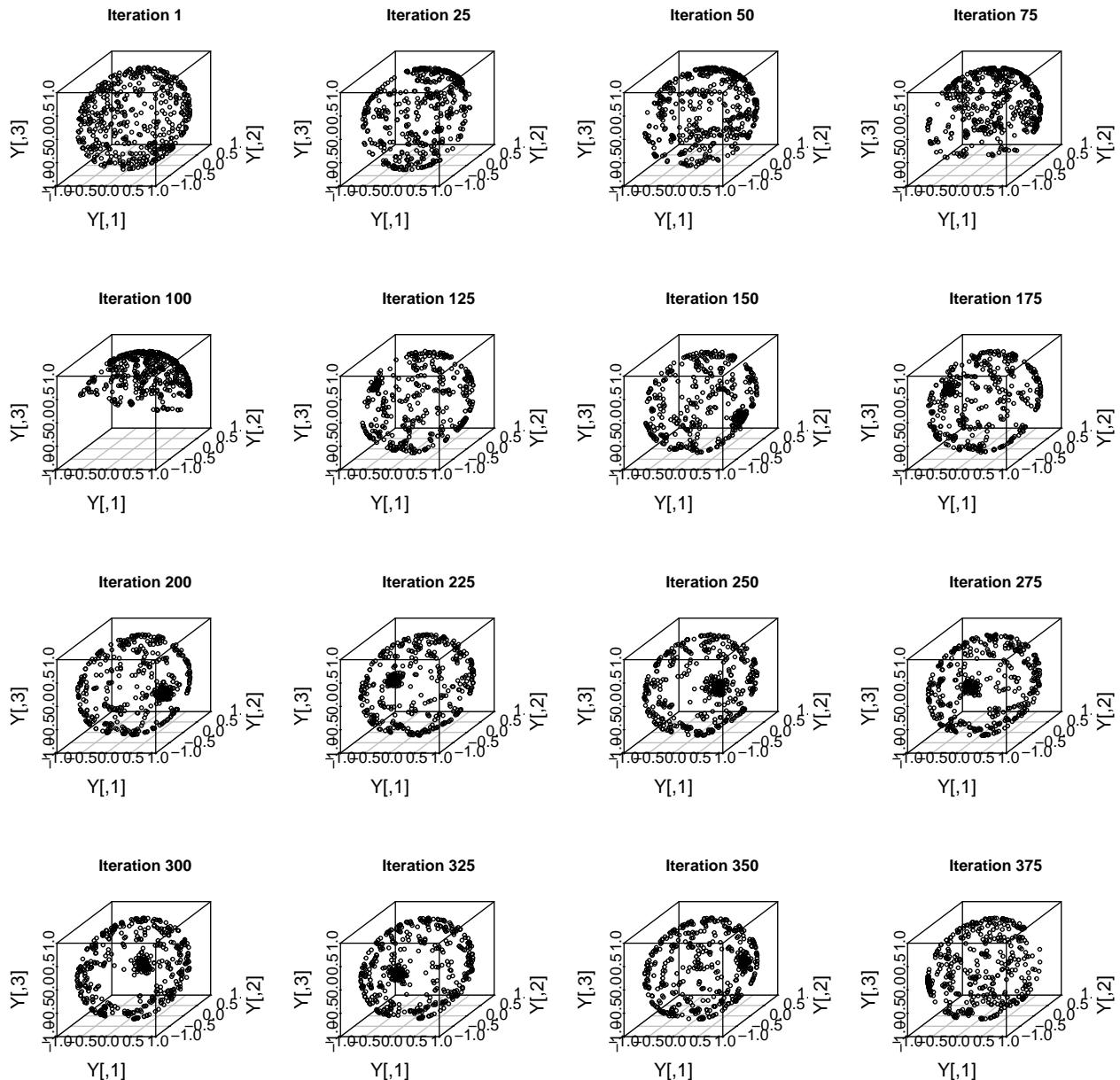
## best it: 102; best obj: 2.070e+00
## It: 327; obj: 2.262e+00; abs: 3.821e-02; rel: 1.661e-02; norm: 3.822e-01; mom: 1.614e+01;
## best it: 102; best obj: 2.070e+00
## It: 328; obj: 2.267e+00; abs: 5.863e-03; rel: 2.593e-03; norm: 3.839e-01; mom: 1.608e+01;
## best it: 102; best obj: 2.070e+00
## It: 329; obj: 2.288e+00; abs: 2.058e-02; rel: 9.075e-03; norm: 3.794e-01; mom: 1.609e+01;
## best it: 102; best obj: 2.070e+00
## It: 330; obj: 2.293e+00; abs: 4.976e-03; rel: 2.175e-03; norm: 3.817e-01; mom: 1.609e+01;
## best it: 102; best obj: 2.070e+00
## It: 331; obj: 2.284e+00; abs: 8.952e-03; rel: 3.904e-03; norm: 3.820e-01; mom: 1.612e+01;
## best it: 102; best obj: 2.070e+00
## It: 332; obj: 2.287e+00; abs: 2.941e-03; rel: 1.288e-03; norm: 3.869e-01; mom: 1.623e+01;
## best it: 102; best obj: 2.070e+00
## It: 333; obj: 2.279e+00; abs: 8.204e-03; rel: 3.587e-03; norm: 3.829e-01; mom: 1.632e+01;
## best it: 102; best obj: 2.070e+00
## It: 334; obj: 2.283e+00; abs: 3.745e-03; rel: 1.644e-03; norm: 3.887e-01; mom: 1.615e+01;
## best it: 102; best obj: 2.070e+00
## It: 335; obj: 2.284e+00; abs: 1.377e-03; rel: 6.032e-04; norm: 3.837e-01; mom: 1.626e+01;
## best it: 102; best obj: 2.070e+00
## It: 336; obj: 2.276e+00; abs: 7.434e-03; rel: 3.255e-03; norm: 3.833e-01; mom: 1.623e+01;
## best it: 102; best obj: 2.070e+00
## It: 337; obj: 2.284e+00; abs: 7.112e-03; rel: 3.124e-03; norm: 3.751e-01; mom: 1.585e+01;
## best it: 102; best obj: 2.070e+00
## It: 338; obj: 2.291e+00; abs: 7.418e-03; rel: 3.249e-03; norm: 3.821e-01; mom: 1.592e+01;
## best it: 102; best obj: 2.070e+00
## It: 339; obj: 2.278e+00; abs: 1.266e-02; rel: 5.527e-03; norm: 3.837e-01; mom: 1.612e+01;
## best it: 102; best obj: 2.070e+00
## It: 340; obj: 2.287e+00; abs: 8.690e-03; rel: 3.814e-03; norm: 3.766e-01; mom: 1.598e+01;
## best it: 102; best obj: 2.070e+00
## It: 341; obj: 2.289e+00; abs: 2.251e-03; rel: 9.844e-04; norm: 3.799e-01; mom: 1.600e+01;
## best it: 102; best obj: 2.070e+00
## It: 342; obj: 2.271e+00; abs: 1.848e-02; rel: 8.073e-03; norm: 3.812e-01; mom: 1.604e+01;
## best it: 102; best obj: 2.070e+00
## It: 343; obj: 2.263e+00; abs: 7.474e-03; rel: 3.291e-03; norm: 3.755e-01; mom: 1.607e+01;
## best it: 102; best obj: 2.070e+00
## It: 344; obj: 2.275e+00; abs: 1.131e-02; rel: 4.998e-03; norm: 3.732e-01; mom: 1.582e+01;
## best it: 102; best obj: 2.070e+00
## It: 345; obj: 2.289e+00; abs: 1.427e-02; rel: 6.274e-03; norm: 3.737e-01; mom: 1.571e+01;
## best it: 102; best obj: 2.070e+00
## It: 346; obj: 2.269e+00; abs: 1.972e-02; rel: 8.616e-03; norm: 3.785e-01; mom: 1.580e+01;
## best it: 102; best obj: 2.070e+00
## It: 347; obj: 2.272e+00; abs: 3.002e-03; rel: 1.323e-03; norm: 3.809e-01; mom: 1.587e+01;
## best it: 102; best obj: 2.070e+00
## It: 348; obj: 2.273e+00; abs: 8.882e-04; rel: 3.909e-04; norm: 3.877e-01; mom: 1.604e+01;
## best it: 102; best obj: 2.070e+00
## It: 349; obj: 2.301e+00; abs: 2.806e-02; rel: 1.234e-02; norm: 3.828e-01; mom: 1.618e+01;
## best it: 102; best obj: 2.070e+00
## It: 350; obj: 2.293e+00; abs: 7.651e-03; rel: 3.325e-03; norm: 3.764e-01; mom: 1.606e+01;
## best it: 102; best obj: 2.070e+00
## It: 351; obj: 2.287e+00; abs: 6.848e-03; rel: 2.986e-03; norm: 3.734e-01; mom: 1.607e+01;
## best it: 102; best obj: 2.070e+00
## It: 352; obj: 2.295e+00; abs: 8.756e-03; rel: 3.829e-03; norm: 3.766e-01; mom: 1.568e+01;
## best it: 102; best obj: 2.070e+00

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## It: 353; obj: 2.302e+00; abs: 6.381e-03; rel: 2.780e-03; norm: 3.796e-01; mom: 1.598e+01;
## best it: 102; best obj: 2.070e+00
## It: 354; obj: 2.282e+00; abs: 1.948e-02; rel: 8.462e-03; norm: 3.785e-01; mom: 1.603e+01;
## best it: 102; best obj: 2.070e+00
## It: 355; obj: 2.295e+00; abs: 1.226e-02; rel: 5.372e-03; norm: 3.817e-01; mom: 1.594e+01;
## best it: 102; best obj: 2.070e+00
## It: 356; obj: 2.315e+00; abs: 2.003e-02; rel: 8.729e-03; norm: 3.783e-01; mom: 1.591e+01;
## best it: 102; best obj: 2.070e+00
## It: 357; obj: 2.320e+00; abs: 5.256e-03; rel: 2.271e-03; norm: 3.840e-01; mom: 1.603e+01;
## best it: 102; best obj: 2.070e+00
## It: 358; obj: 2.312e+00; abs: 7.954e-03; rel: 3.429e-03; norm: 3.893e-01; mom: 1.607e+01;
## best it: 102; best obj: 2.070e+00
## It: 359; obj: 2.317e+00; abs: 5.067e-03; rel: 2.192e-03; norm: 3.957e-01; mom: 1.625e+01;
## best it: 102; best obj: 2.070e+00
## It: 360; obj: 2.320e+00; abs: 3.132e-03; rel: 1.352e-03; norm: 3.952e-01; mom: 1.626e+01;
## best it: 102; best obj: 2.070e+00
## It: 361; obj: 2.333e+00; abs: 1.302e-02; rel: 5.613e-03; norm: 3.939e-01; mom: 1.649e+01;
## best it: 102; best obj: 2.070e+00
## It: 362; obj: 2.305e+00; abs: 2.845e-02; rel: 1.219e-02; norm: 3.873e-01; mom: 1.637e+01;
## best it: 102; best obj: 2.070e+00
## It: 363; obj: 2.311e+00; abs: 6.466e-03; rel: 2.806e-03; norm: 3.892e-01; mom: 1.632e+01;
## best it: 102; best obj: 2.070e+00
## It: 364; obj: 2.313e+00; abs: 1.923e-03; rel: 8.320e-04; norm: 3.887e-01; mom: 1.613e+01;
## best it: 102; best obj: 2.070e+00
## It: 365; obj: 2.333e+00; abs: 2.001e-02; rel: 8.650e-03; norm: 3.893e-01; mom: 1.630e+01;
## best it: 102; best obj: 2.070e+00
## It: 366; obj: 2.330e+00; abs: 3.137e-03; rel: 1.345e-03; norm: 3.838e-01; mom: 1.614e+01;
## best it: 102; best obj: 2.070e+00
## It: 367; obj: 2.326e+00; abs: 4.049e-03; rel: 1.738e-03; norm: 3.868e-01; mom: 1.611e+01;
## best it: 102; best obj: 2.070e+00
## It: 368; obj: 2.328e+00; abs: 1.981e-03; rel: 8.519e-04; norm: 3.898e-01; mom: 1.614e+01;
## best it: 102; best obj: 2.070e+00
## It: 369; obj: 2.339e+00; abs: 1.097e-02; rel: 4.712e-03; norm: 3.986e-01; mom: 1.623e+01;
## best it: 102; best obj: 2.070e+00
## It: 370; obj: 2.337e+00; abs: 2.238e-03; rel: 9.568e-04; norm: 3.977e-01; mom: 1.638e+01;
## best it: 102; best obj: 2.070e+00
## It: 371; obj: 2.341e+00; abs: 4.152e-03; rel: 1.777e-03; norm: 3.990e-01; mom: 1.622e+01;
## best it: 102; best obj: 2.070e+00
## It: 372; obj: 2.335e+00; abs: 5.494e-03; rel: 2.347e-03; norm: 3.952e-01; mom: 1.616e+01;
## best it: 102; best obj: 2.070e+00
## It: 373; obj: 2.343e+00; abs: 8.164e-03; rel: 3.496e-03; norm: 4.051e-01; mom: 1.649e+01;
## best it: 102; best obj: 2.070e+00
## It: 374; obj: 2.343e+00; abs: 6.243e-04; rel: 2.664e-04; norm: 3.990e-01; mom: 1.650e+01;
## best it: 102; best obj: 2.070e+00
## It: 375; obj: 2.338e+00; abs: 4.320e-03; rel: 1.844e-03; norm: 4.011e-01; mom: 1.648e+01;
## best it: 102; best obj: 2.070e+00

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## It: 376; obj: 2.336e+00; abs: 2.496e-03; rel: 1.067e-03; norm: 3.960e-01; mom: 1.629e+01;
## best it: 102; best obj: 2.070e+00
## It: 377; obj: 2.367e+00; abs: 3.131e-02; rel: 1.340e-02; norm: 4.088e-01; mom: 1.642e+01;
## best it: 102; best obj: 2.070e+00
## It: 378; obj: 2.353e+00; abs: 1.419e-02; rel: 5.992e-03; norm: 4.112e-01; mom: 1.643e+01;
## best it: 102; best obj: 2.070e+00
## It: 379; obj: 2.356e+00; abs: 3.407e-03; rel: 1.448e-03; norm: 4.200e-01; mom: 1.668e+01;
## best it: 102; best obj: 2.070e+00
## It: 380; obj: 2.348e+00; abs: 8.111e-03; rel: 3.442e-03; norm: 4.148e-01; mom: 1.657e+01;
## best it: 102; best obj: 2.070e+00
## It: 381; obj: 2.352e+00; abs: 4.004e-03; rel: 1.705e-03; norm: 4.238e-01; mom: 1.679e+01;
## best it: 102; best obj: 2.070e+00
## It: 382; obj: 2.339e+00; abs: 1.309e-02; rel: 5.563e-03; norm: 4.174e-01; mom: 1.672e+01;
## best it: 102; best obj: 2.070e+00
## It: 383; obj: 2.346e+00; abs: 6.277e-03; rel: 2.683e-03; norm: 4.160e-01; mom: 1.666e+01;

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## best it: 102; best obj: 2.070e+00
## It: 384; obj: 2.335e+00; abs: 1.081e-02; rel: 4.610e-03; norm: 4.086e-01; mom: 1.654e+01;
## best it: 102; best obj: 2.070e+00
## It: 385; obj: 2.349e+00; abs: 1.419e-02; rel: 6.076e-03; norm: 4.097e-01; mom: 1.652e+01;
## best it: 102; best obj: 2.070e+00
## It: 386; obj: 2.336e+00; abs: 1.292e-02; rel: 5.499e-03; norm: 4.043e-01; mom: 1.660e+01;
## best it: 102; best obj: 2.070e+00
## It: 387; obj: 2.350e+00; abs: 1.426e-02; rel: 6.106e-03; norm: 4.063e-01; mom: 1.643e+01;
## best it: 102; best obj: 2.070e+00
## It: 388; obj: 2.335e+00; abs: 1.568e-02; rel: 6.673e-03; norm: 4.058e-01; mom: 1.643e+01;
## best it: 102; best obj: 2.070e+00
## It: 389; obj: 2.353e+00; abs: 1.817e-02; rel: 7.783e-03; norm: 4.129e-01; mom: 1.644e+01;
## best it: 102; best obj: 2.070e+00
## It: 390; obj: 2.343e+00; abs: 9.606e-03; rel: 4.083e-03; norm: 4.049e-01; mom: 1.644e+01;
## best it: 102; best obj: 2.070e+00
## It: 391; obj: 2.361e+00; abs: 1.804e-02; rel: 7.699e-03; norm: 4.160e-01; mom: 1.659e+01;
## best it: 102; best obj: 2.070e+00
## It: 392; obj: 2.352e+00; abs: 9.509e-03; rel: 4.027e-03; norm: 4.106e-01; mom: 1.657e+01;
## best it: 102; best obj: 2.070e+00
## It: 393; obj: 2.350e+00; abs: 1.825e-03; rel: 7.759e-04; norm: 4.143e-01; mom: 1.658e+01;
## best it: 102; best obj: 2.070e+00
## It: 394; obj: 2.355e+00; abs: 5.434e-03; rel: 2.312e-03; norm: 4.109e-01; mom: 1.666e+01;
## best it: 102; best obj: 2.070e+00
## It: 395; obj: 2.353e+00; abs: 2.164e-03; rel: 9.188e-04; norm: 4.183e-01; mom: 1.667e+01;
## best it: 102; best obj: 2.070e+00
## It: 396; obj: 2.347e+00; abs: 5.747e-03; rel: 2.442e-03; norm: 4.131e-01; mom: 1.666e+01;
## best it: 102; best obj: 2.070e+00
## It: 397; obj: 2.345e+00; abs: 1.944e-03; rel: 8.281e-04; norm: 4.174e-01; mom: 1.664e+01;
## best it: 102; best obj: 2.070e+00
## It: 398; obj: 2.352e+00; abs: 6.165e-03; rel: 2.628e-03; norm: 4.103e-01; mom: 1.664e+01;
## best it: 102; best obj: 2.070e+00
## It: 399; obj: 2.365e+00; abs: 1.360e-02; rel: 5.785e-03; norm: 4.148e-01; mom: 1.654e+01;
## best it: 102; best obj: 2.070e+00
## It: 400; obj: 2.364e+00; abs: 1.089e-03; rel: 4.605e-04; norm: 4.110e-01; mom: 1.664e+01;
## best it: 102; best obj: 2.070e+00
## It: 401; obj: 2.358e+00; abs: 5.814e-03; rel: 2.459e-03; norm: 4.190e-01; mom: 1.651e+01;
## best it: 102; best obj: 2.070e+00
## It: 402; obj: 2.350e+00; abs: 8.768e-03; rel: 3.718e-03; norm: 4.148e-01; mom: 1.672e+01;
## best it: 102; best obj: 2.070e+00
## It: 403; obj: 2.351e+00; abs: 1.490e-03; rel: 6.342e-04; norm: 4.226e-01; mom: 1.675e+01;
## best it: 102; best obj: 2.070e+00
## It: 404; obj: 2.341e+00; abs: 9.756e-03; rel: 4.150e-03; norm: 4.160e-01; mom: 1.678e+01;
## best it: 102; best obj: 2.070e+00
## It: 405; obj: 2.351e+00; abs: 9.499e-03; rel: 4.057e-03; norm: 4.212e-01; mom: 1.676e+01;
## best it: 102; best obj: 2.070e+00
## It: 406; obj: 2.351e+00; abs: 7.107e-04; rel: 3.023e-04; norm: 4.122e-01; mom: 1.672e+01;
## best it: 102; best obj: 2.070e+00
## It: 407; obj: 2.349e+00; abs: 2.469e-03; rel: 1.050e-03; norm: 4.217e-01; mom: 1.664e+01;
## best it: 102; best obj: 2.070e+00
## It: 408; obj: 2.344e+00; abs: 4.672e-03; rel: 1.989e-03; norm: 4.144e-01; mom: 1.662e+01;
## best it: 102; best obj: 2.070e+00
## It: 409; obj: 2.339e+00; abs: 5.630e-03; rel: 2.402e-03; norm: 4.197e-01; mom: 1.673e+01;
## best it: 102; best obj: 2.070e+00

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## It: 410; obj: 2.348e+00; abs: 9.419e-03; rel: 4.027e-03; norm: 4.146e-01; mom: 1.664e+01;
## best it: 102; best obj: 2.070e+00
## It: 411; obj: 2.343e+00; abs: 5.429e-03; rel: 2.312e-03; norm: 4.204e-01; mom: 1.672e+01;
## best it: 102; best obj: 2.070e+00
## It: 412; obj: 2.355e+00; abs: 1.239e-02; rel: 5.289e-03; norm: 4.162e-01; mom: 1.671e+01;
## best it: 102; best obj: 2.070e+00
## It: 413; obj: 2.346e+00; abs: 9.379e-03; rel: 3.982e-03; norm: 4.180e-01; mom: 1.670e+01;
## best it: 102; best obj: 2.070e+00
## It: 414; obj: 2.342e+00; abs: 3.768e-03; rel: 1.606e-03; norm: 4.139e-01; mom: 1.678e+01;
## best it: 102; best obj: 2.070e+00
## It: 415; obj: 2.349e+00; abs: 7.488e-03; rel: 3.197e-03; norm: 4.161e-01; mom: 1.659e+01;
## best it: 102; best obj: 2.070e+00
## It: 416; obj: 2.353e+00; abs: 3.915e-03; rel: 1.666e-03; norm: 4.099e-01; mom: 1.659e+01;
## best it: 102; best obj: 2.070e+00
## It: 417; obj: 2.348e+00; abs: 5.135e-03; rel: 2.182e-03; norm: 4.153e-01; mom: 1.664e+01;
## best it: 102; best obj: 2.070e+00
## It: 418; obj: 2.352e+00; abs: 3.437e-03; rel: 1.464e-03; norm: 4.167e-01; mom: 1.659e+01;
## best it: 102; best obj: 2.070e+00
## It: 419; obj: 2.337e+00; abs: 1.451e-02; rel: 6.171e-03; norm: 4.222e-01; mom: 1.672e+01;
## best it: 102; best obj: 2.070e+00
## It: 420; obj: 2.351e+00; abs: 1.429e-02; rel: 6.116e-03; norm: 4.152e-01; mom: 1.673e+01;
## best it: 102; best obj: 2.070e+00
## It: 421; obj: 2.341e+00; abs: 1.042e-02; rel: 4.430e-03; norm: 4.198e-01; mom: 1.668e+01;
## best it: 102; best obj: 2.070e+00
## It: 422; obj: 2.339e+00; abs: 2.456e-03; rel: 1.049e-03; norm: 4.157e-01; mom: 1.681e+01;
## best it: 102; best obj: 2.070e+00
## It: 423; obj: 2.330e+00; abs: 8.691e-03; rel: 3.716e-03; norm: 4.206e-01; mom: 1.668e+01;
## best it: 102; best obj: 2.070e+00
## It: 424; obj: 2.346e+00; abs: 1.643e-02; rel: 7.052e-03; norm: 4.110e-01; mom: 1.669e+01;
## best it: 102; best obj: 2.070e+00
## It: 425; obj: 2.356e+00; abs: 9.588e-03; rel: 4.087e-03; norm: 4.172e-01; mom: 1.665e+01;
## best it: 102; best obj: 2.070e+00

## It: 426; obj: 2.353e+00; abs: 3.248e-03; rel: 1.379e-03; norm: 4.142e-01; mom: 1.676e+01;
## best it: 102; best obj: 2.070e+00
## It: 427; obj: 2.356e+00; abs: 3.270e-03; rel: 1.390e-03; norm: 4.223e-01; mom: 1.660e+01;
## best it: 102; best obj: 2.070e+00
## It: 428; obj: 2.346e+00; abs: 1.027e-02; rel: 4.358e-03; norm: 4.215e-01; mom: 1.678e+01;
## best it: 102; best obj: 2.070e+00
## It: 429; obj: 2.348e+00; abs: 2.039e-03; rel: 8.695e-04; norm: 4.251e-01; mom: 1.678e+01;
## best it: 102; best obj: 2.070e+00
## It: 430; obj: 2.350e+00; abs: 2.402e-03; rel: 1.023e-03; norm: 4.159e-01; mom: 1.677e+01;
## best it: 102; best obj: 2.070e+00
## It: 431; obj: 2.331e+00; abs: 1.865e-02; rel: 7.937e-03; norm: 4.232e-01; mom: 1.668e+01;
## best it: 102; best obj: 2.070e+00
## It: 432; obj: 2.356e+00; abs: 2.441e-02; rel: 1.047e-02; norm: 4.133e-01; mom: 1.667e+01;
## best it: 102; best obj: 2.070e+00
## It: 433; obj: 2.354e+00; abs: 1.649e-03; rel: 7.001e-04; norm: 4.240e-01; mom: 1.664e+01;
## best it: 102; best obj: 2.070e+00
## It: 434; obj: 2.349e+00; abs: 5.089e-03; rel: 2.162e-03; norm: 4.209e-01; mom: 1.686e+01;
## best it: 102; best obj: 2.070e+00
## It: 435; obj: 2.341e+00; abs: 8.206e-03; rel: 3.493e-03; norm: 4.267e-01; mom: 1.674e+01;
## best it: 102; best obj: 2.070e+00
## It: 436; obj: 2.348e+00; abs: 7.096e-03; rel: 3.031e-03; norm: 4.183e-01; mom: 1.680e+01;

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## best it: 102; best obj: 2.070e+00
## It: 437; obj: 2.343e+00; abs: 5.010e-03; rel: 2.134e-03; norm: 4.221e-01; mom: 1.677e+01;
## best it: 102; best obj: 2.070e+00
## It: 438; obj: 2.339e+00; abs: 3.712e-03; rel: 1.584e-03; norm: 4.157e-01; mom: 1.682e+01;
## best it: 102; best obj: 2.070e+00
## It: 439; obj: 2.330e+00; abs: 9.167e-03; rel: 3.919e-03; norm: 4.197e-01; mom: 1.669e+01;
## best it: 102; best obj: 2.070e+00
## It: 440; obj: 2.348e+00; abs: 1.783e-02; rel: 7.652e-03; norm: 4.115e-01; mom: 1.675e+01;
## best it: 102; best obj: 2.070e+00
## It: 441; obj: 2.338e+00; abs: 1.017e-02; rel: 4.330e-03; norm: 4.163e-01; mom: 1.665e+01;
## best it: 102; best obj: 2.070e+00
## It: 442; obj: 2.355e+00; abs: 1.685e-02; rel: 7.207e-03; norm: 4.157e-01; mom: 1.669e+01;
## best it: 102; best obj: 2.070e+00
## It: 443; obj: 2.327e+00; abs: 2.799e-02; rel: 1.189e-02; norm: 4.208e-01; mom: 1.665e+01;
## best it: 102; best obj: 2.070e+00
## It: 444; obj: 2.356e+00; abs: 2.946e-02; rel: 1.266e-02; norm: 4.138e-01; mom: 1.676e+01;
## best it: 102; best obj: 2.070e+00
## It: 445; obj: 2.341e+00; abs: 1.533e-02; rel: 6.505e-03; norm: 4.213e-01; mom: 1.674e+01;
## best it: 102; best obj: 2.070e+00
## It: 446; obj: 2.342e+00; abs: 1.218e-03; rel: 5.204e-04; norm: 4.163e-01; mom: 1.687e+01;
## best it: 102; best obj: 2.070e+00
## It: 447; obj: 2.349e+00; abs: 6.835e-03; rel: 2.919e-03; norm: 4.185e-01; mom: 1.664e+01;
## best it: 102; best obj: 2.070e+00
## It: 448; obj: 2.349e+00; abs: 1.581e-04; rel: 6.733e-05; norm: 4.115e-01; mom: 1.663e+01;
## best it: 102; best obj: 2.070e+00
## It: 449; obj: 2.352e+00; abs: 3.830e-03; rel: 1.631e-03; norm: 4.200e-01; mom: 1.668e+01;
## best it: 102; best obj: 2.070e+00
## It: 450; obj: 2.354e+00; abs: 1.804e-03; rel: 7.667e-04; norm: 4.172e-01; mom: 1.674e+01;
## best it: 102; best obj: 2.070e+00

## It: 451; obj: 2.335e+00; abs: 1.918e-02; rel: 8.148e-03; norm: 4.241e-01; mom: 1.673e+01;
## best it: 102; best obj: 2.070e+00
## It: 452; obj: 2.353e+00; abs: 1.836e-02; rel: 7.863e-03; norm: 4.172e-01; mom: 1.667e+01;
## best it: 102; best obj: 2.070e+00
## It: 453; obj: 2.349e+00; abs: 4.618e-03; rel: 1.962e-03; norm: 4.249e-01; mom: 1.667e+01;
## best it: 102; best obj: 2.070e+00
## It: 454; obj: 2.346e+00; abs: 2.347e-03; rel: 9.991e-04; norm: 4.198e-01; mom: 1.682e+01;
## best it: 102; best obj: 2.070e+00
## It: 455; obj: 2.339e+00; abs: 7.814e-03; rel: 3.330e-03; norm: 4.260e-01; mom: 1.673e+01;
## best it: 102; best obj: 2.070e+00
## It: 456; obj: 2.347e+00; abs: 8.250e-03; rel: 3.528e-03; norm: 4.185e-01; mom: 1.677e+01;
## best it: 102; best obj: 2.070e+00
## It: 457; obj: 2.335e+00; abs: 1.178e-02; rel: 5.018e-03; norm: 4.238e-01; mom: 1.680e+01;
## best it: 102; best obj: 2.070e+00
## It: 458; obj: 2.359e+00; abs: 2.338e-02; rel: 1.001e-02; norm: 4.166e-01; mom: 1.678e+01;
## best it: 102; best obj: 2.070e+00
## It: 459; obj: 2.348e+00; abs: 1.058e-02; rel: 4.487e-03; norm: 4.203e-01; mom: 1.669e+01;
## best it: 102; best obj: 2.070e+00
## It: 460; obj: 2.346e+00; abs: 1.860e-03; rel: 7.923e-04; norm: 4.187e-01; mom: 1.685e+01;
## best it: 102; best obj: 2.070e+00
## It: 461; obj: 2.342e+00; abs: 4.153e-03; rel: 1.770e-03; norm: 4.239e-01; mom: 1.672e+01;
## best it: 102; best obj: 2.070e+00
## It: 462; obj: 2.343e+00; abs: 7.739e-04; rel: 3.305e-04; norm: 4.198e-01; mom: 1.692e+01;
## best it: 102; best obj: 2.070e+00

```

```

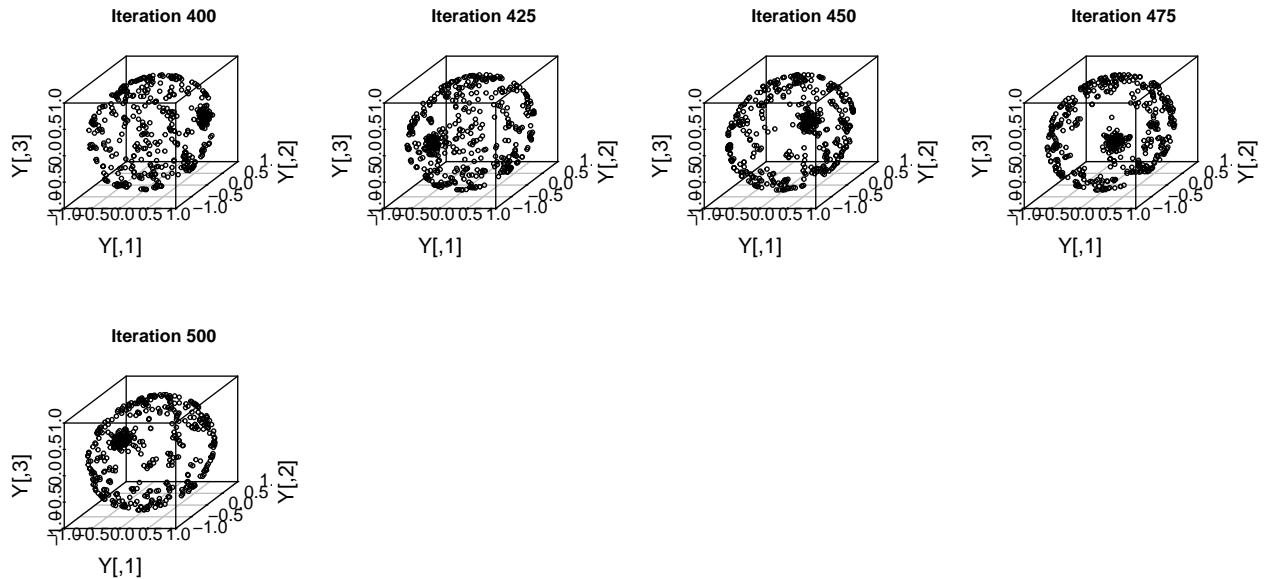
## It: 463; obj: 2.342e+00; abs: 3.461e-04; rel: 1.477e-04; norm: 4.247e-01; mom: 1.686e+01;
## best it: 102; best obj: 2.070e+00
## It: 464; obj: 2.371e+00; abs: 2.888e-02; rel: 1.233e-02; norm: 4.157e-01; mom: 1.681e+01;
## best it: 102; best obj: 2.070e+00
## It: 465; obj: 2.350e+00; abs: 2.118e-02; rel: 8.930e-03; norm: 4.208e-01; mom: 1.668e+01;
## best it: 102; best obj: 2.070e+00
## It: 466; obj: 2.357e+00; abs: 7.294e-03; rel: 3.104e-03; norm: 4.147e-01; mom: 1.676e+01;
## best it: 102; best obj: 2.070e+00
## It: 467; obj: 2.344e+00; abs: 1.332e-02; rel: 5.649e-03; norm: 4.224e-01; mom: 1.674e+01;
## best it: 102; best obj: 2.070e+00
## It: 468; obj: 2.343e+00; abs: 1.152e-03; rel: 4.913e-04; norm: 4.159e-01; mom: 1.675e+01;
## best it: 102; best obj: 2.070e+00
## It: 469; obj: 2.343e+00; abs: 3.051e-05; rel: 1.302e-05; norm: 4.236e-01; mom: 1.679e+01;
## best it: 102; best obj: 2.070e+00
## It: 470; obj: 2.347e+00; abs: 4.447e-03; rel: 1.898e-03; norm: 4.197e-01; mom: 1.686e+01;
## best it: 102; best obj: 2.070e+00
## It: 471; obj: 2.338e+00; abs: 9.187e-03; rel: 3.914e-03; norm: 4.230e-01; mom: 1.677e+01;
## best it: 102; best obj: 2.070e+00
## It: 472; obj: 2.347e+00; abs: 9.131e-03; rel: 3.905e-03; norm: 4.151e-01; mom: 1.686e+01;
## best it: 102; best obj: 2.070e+00
## It: 473; obj: 2.344e+00; abs: 3.497e-03; rel: 1.490e-03; norm: 4.177e-01; mom: 1.674e+01;
## best it: 102; best obj: 2.070e+00
## It: 474; obj: 2.340e+00; abs: 4.166e-03; rel: 1.777e-03; norm: 4.169e-01; mom: 1.676e+01;
## best it: 102; best obj: 2.070e+00
## It: 475; obj: 2.335e+00; abs: 4.734e-03; rel: 2.023e-03; norm: 4.191e-01; mom: 1.669e+01;
## best it: 102; best obj: 2.070e+00
## It: 476; obj: 2.348e+00; abs: 1.324e-02; rel: 5.671e-03; norm: 4.134e-01; mom: 1.670e+01;
## best it: 102; best obj: 2.070e+00
## It: 477; obj: 2.342e+00; abs: 5.837e-03; rel: 2.486e-03; norm: 4.173e-01; mom: 1.673e+01;
## best it: 102; best obj: 2.070e+00
## It: 478; obj: 2.347e+00; abs: 4.926e-03; rel: 2.103e-03; norm: 4.134e-01; mom: 1.661e+01;
## best it: 102; best obj: 2.070e+00
## It: 479; obj: 2.339e+00; abs: 8.319e-03; rel: 3.544e-03; norm: 4.210e-01; mom: 1.671e+01;
## best it: 102; best obj: 2.070e+00
## It: 480; obj: 2.350e+00; abs: 1.137e-02; rel: 4.862e-03; norm: 4.154e-01; mom: 1.668e+01;
## best it: 102; best obj: 2.070e+00
## It: 481; obj: 2.342e+00; abs: 8.021e-03; rel: 3.413e-03; norm: 4.160e-01; mom: 1.671e+01;
## best it: 102; best obj: 2.070e+00
## It: 482; obj: 2.338e+00; abs: 3.910e-03; rel: 1.670e-03; norm: 4.128e-01; mom: 1.668e+01;
## best it: 102; best obj: 2.070e+00
## It: 483; obj: 2.347e+00; abs: 8.811e-03; rel: 3.768e-03; norm: 4.120e-01; mom: 1.658e+01;
## best it: 102; best obj: 2.070e+00
## It: 484; obj: 2.348e+00; abs: 5.140e-04; rel: 2.190e-04; norm: 4.114e-01; mom: 1.661e+01;
## best it: 102; best obj: 2.070e+00
## It: 485; obj: 2.354e+00; abs: 5.806e-03; rel: 2.473e-03; norm: 4.137e-01; mom: 1.665e+01;
## best it: 102; best obj: 2.070e+00
## It: 486; obj: 2.363e+00; abs: 9.813e-03; rel: 4.169e-03; norm: 4.124e-01; mom: 1.661e+01;
## best it: 102; best obj: 2.070e+00
## It: 487; obj: 2.352e+00; abs: 1.178e-02; rel: 4.986e-03; norm: 4.173e-01; mom: 1.666e+01;
## best it: 102; best obj: 2.070e+00
## It: 488; obj: 2.365e+00; abs: 1.396e-02; rel: 5.936e-03; norm: 4.160e-01; mom: 1.666e+01;
## best it: 102; best obj: 2.070e+00
## It: 489; obj: 2.355e+00; abs: 1.056e-02; rel: 4.464e-03; norm: 4.194e-01; mom: 1.682e+01;

```

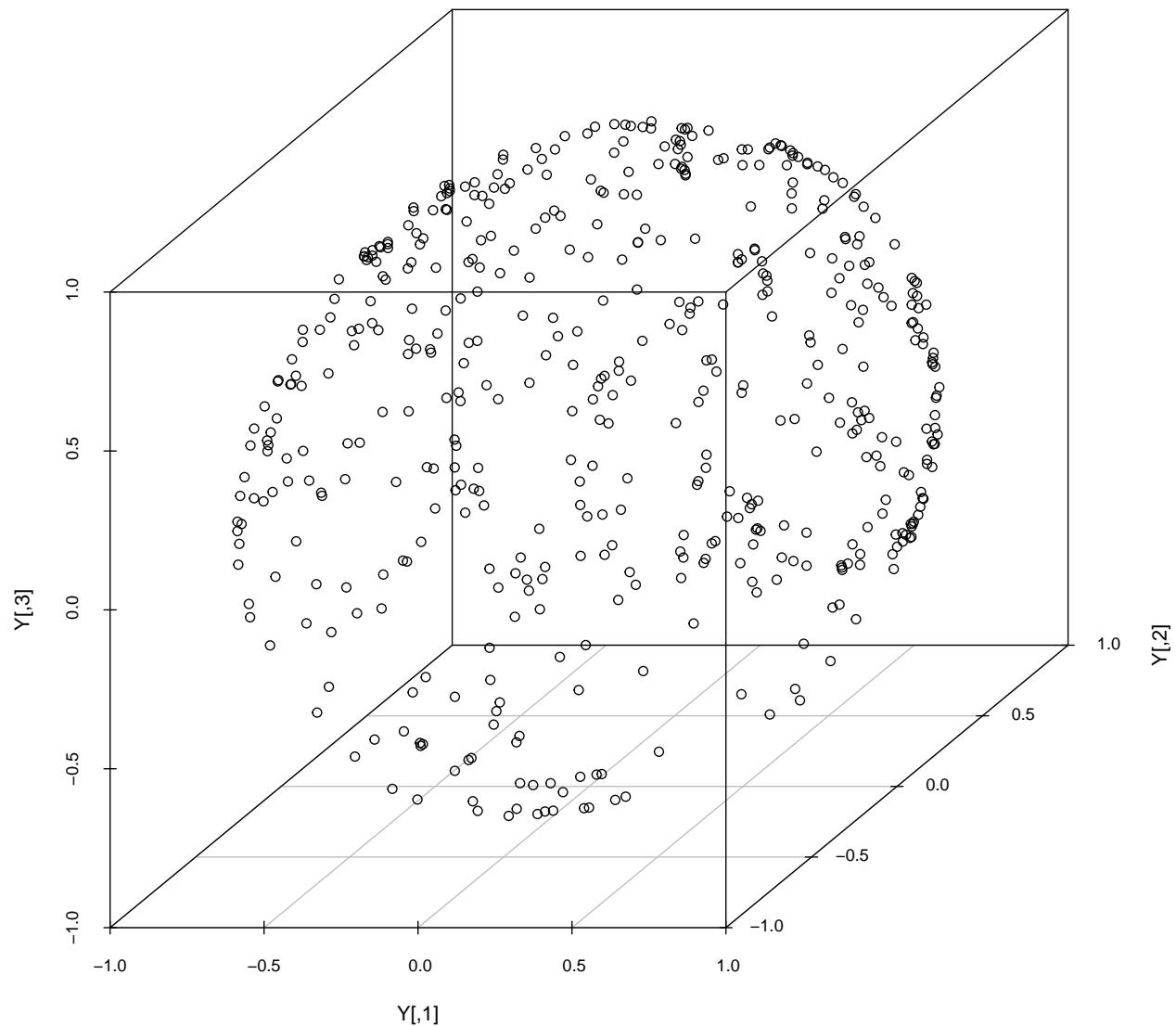
```

## best it: 102; best obj: 2.070e+00
## It: 490; obj: 2.348e+00; abs: 7.237e-03; rel: 3.073e-03; norm: 4.181e-01; mom: 1.691e+01;
## best it: 102; best obj: 2.070e+00
## It: 491; obj: 2.356e+00; abs: 8.698e-03; rel: 3.705e-03; norm: 4.198e-01; mom: 1.684e+01;
## best it: 102; best obj: 2.070e+00
## It: 492; obj: 2.363e+00; abs: 6.750e-03; rel: 2.865e-03; norm: 4.170e-01; mom: 1.682e+01;
## best it: 102; best obj: 2.070e+00
## It: 493; obj: 2.355e+00; abs: 8.023e-03; rel: 3.395e-03; norm: 4.201e-01; mom: 1.691e+01;
## best it: 102; best obj: 2.070e+00
## It: 494; obj: 2.379e+00; abs: 2.436e-02; rel: 1.035e-02; norm: 4.151e-01; mom: 1.673e+01;
## best it: 102; best obj: 2.070e+00
## It: 495; obj: 2.358e+00; abs: 2.152e-02; rel: 9.042e-03; norm: 4.227e-01; mom: 1.677e+01;
## best it: 102; best obj: 2.070e+00
## It: 496; obj: 2.365e+00; abs: 7.409e-03; rel: 3.142e-03; norm: 4.223e-01; mom: 1.676e+01;
## best it: 102; best obj: 2.070e+00
## It: 497; obj: 2.369e+00; abs: 3.941e-03; rel: 1.666e-03; norm: 4.252e-01; mom: 1.687e+01;
## best it: 102; best obj: 2.070e+00
## It: 498; obj: 2.376e+00; abs: 6.739e-03; rel: 2.844e-03; norm: 4.208e-01; mom: 1.699e+01;
## best it: 102; best obj: 2.070e+00
## It: 499; obj: 2.368e+00; abs: 8.492e-03; rel: 3.574e-03; norm: 4.267e-01; mom: 1.697e+01;
## best it: 102; best obj: 2.070e+00
## It: 500; obj: 2.375e+00; abs: 7.064e-03; rel: 2.984e-03; norm: 4.219e-01; mom: 1.682e+01;
## best it: 102; best obj: 2.070e+00

```

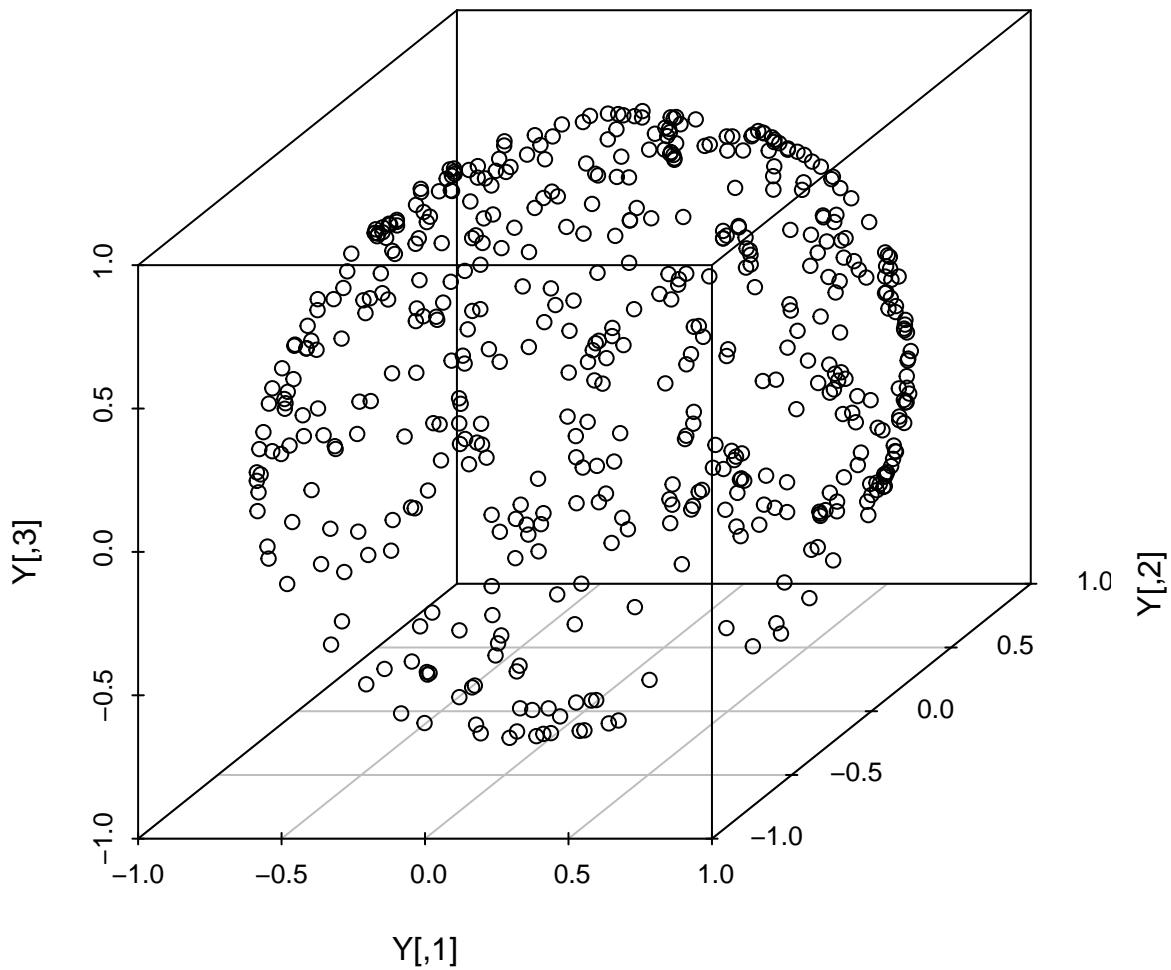


### Iteration 102



```
Y <- res_pscsne$best_Y
```

```
scatterplot3d::scatterplot3d(Y, xlim = c(-1, 1), ylim = c(-1, 1), zlim = c(-1, 1))
```



## Case 4

Playing with belts of points onto the sphere. First, let's generate the data

```
rotate_matrix_z_axis <- function(alpha) {
  deg2rad <- function(deg) {(deg * pi) / (180)}
  rads <- deg2rad(alpha)
  matrix(c(cos(rads), -sin(rads), 0,
          sin(rads), cos(rads), 0,
          0, 0, 1),
         byrow = T, nrow = 3)
}

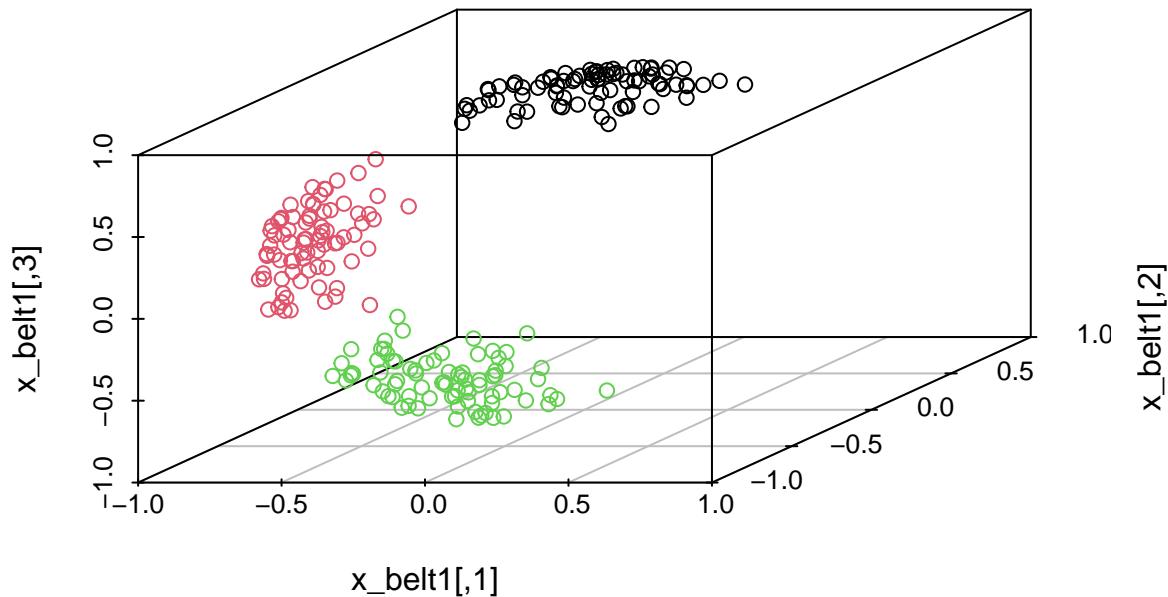
rotate_matrix_x_axis <- function(alpha) {
  deg2rad <- function(deg) {(deg * pi) / (180)}
  rads <- deg2rad(alpha)
  matrix(c(1, 0, 0,
          0, cos(rads), -sin(rads),
          0, sin(rads), cos(rads)),
         byrow = T, nrow = 3)
}
```

```

rotate_matrix_y_axis <- function(alpha) {
  deg2rad <- function(deg) {(deg * pi) / (180)}
  rads <- deg2rad(alpha)
  matrix(c(cos(rads), 0, sin(rads),
          0, 1, 0,
          -sin(rads), 0, cos(rads)),
         byrow = T, nrow = 3)
}

p = 2
set.seed(2)
# A <- matrix(runif((p + 1)^2)*2-0.5, ncol = p + 1)
# sigma <- t(A) %*% A
sigma <- diag(c(10, 2, .5))
n <- 80
# x_1_belt1 <- rotasym::r_ACG(n, sigma)
x_1_belt1 <- sphunif::r_alt(n = n, p = 3, alt = "SC", kappa = 200, nu = 0.9999)[,,1]
rotate_mat_90 <- rotate_matrix_y_axis(90)
x_2_belt1 <- x_1_belt1 %*% rotate_mat_90
rotate_mat_45 <- rotate_matrix_y_axis(60)
x_3_belt1 <- x_2_belt1 %*% rotate_mat_45
x_belt1 <- rbind(x_1_belt1, x_2_belt1, x_3_belt1)
scatterplot3d::scatterplot3d(x_belt1, xlim = c(-1, 1),
                             ylim = c(-1, 1), zlim = c(-1, 1),
                             color = rep(c(1,2,3), each=n))

```



```

rgl::plot3d(0, 0, 0, xlim = c(-1, 1), ylim = c(-1, 1), zlim = c(-1, 1),
            radius = 1, type = "s", col = "lightblue",
            lit = FALSE)
rgl::points3d(x_belt1, col = rep(c(1,2,3), each=n))

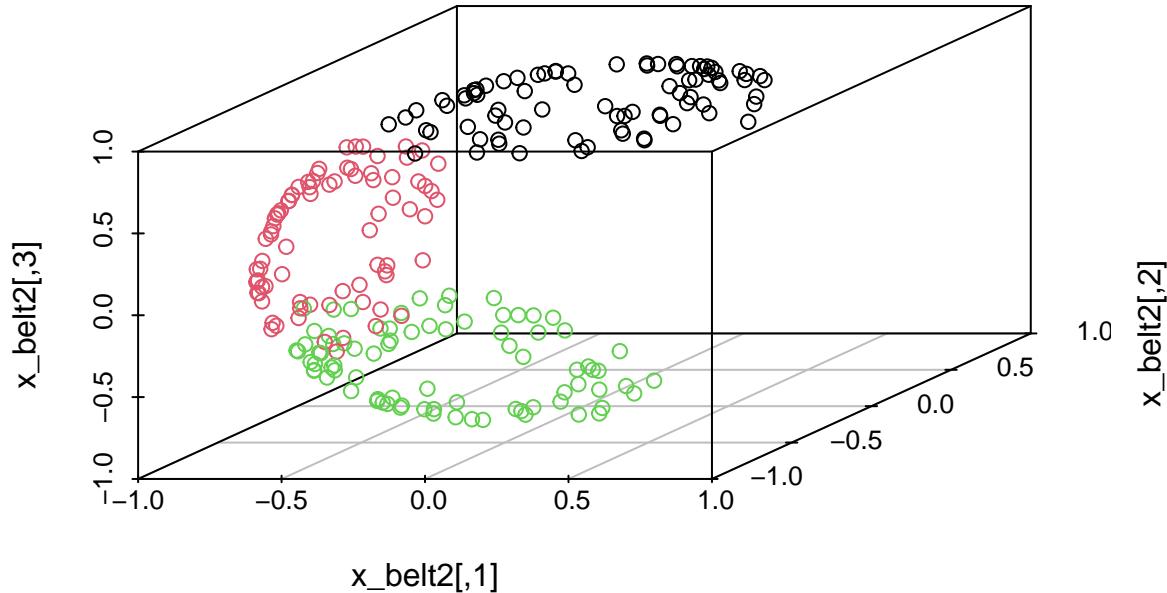
# x_1_belt2 <- rotasym::r_ACG(n, sigma)
x_1_belt2 <- sphunif::r_alt(n = n, p = 3, alt = "SC", kappa = 200, nu = 0.89)[,,1]
x_2_belt2 <- x_1_belt2 %*% rotate_mat_90

```

```

x_3_belt2 <- x_2_belt2 %*% rotate_mat_45
x_belt2 <- rbind(x_1_belt2, x_2_belt2, x_3_belt2)
scatterplot3d::scatterplot3d(x_belt2, xlim = c(-1, 1),
                             ylim = c(-1, 1), zlim = c(-1, 1),
                             color = rep(c(1,2,3), each=n))

```

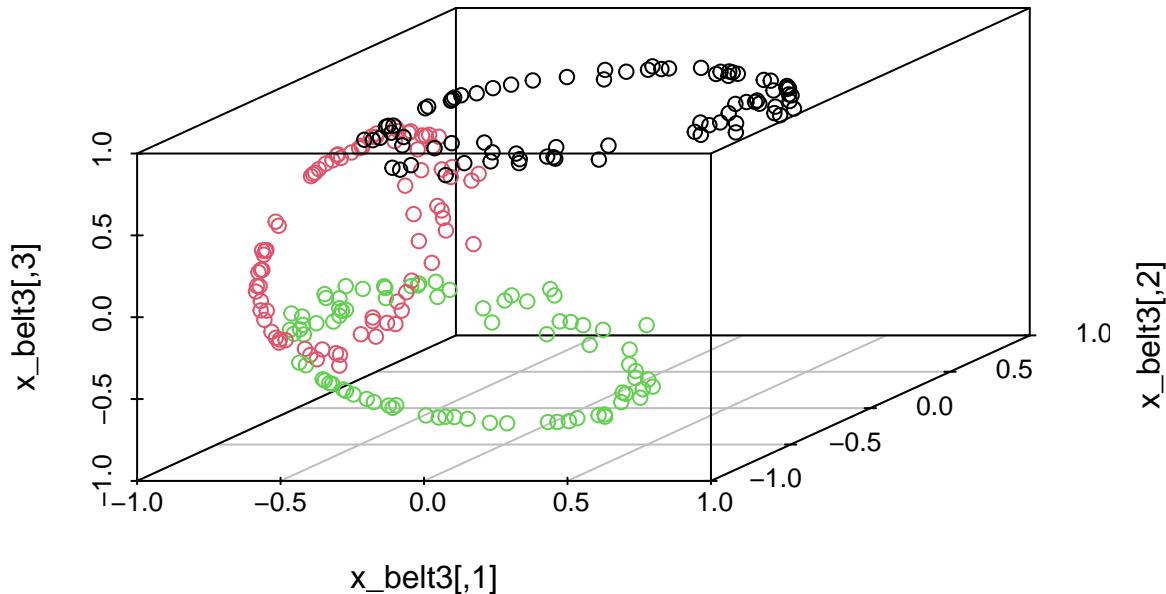


```

rgl::plot3d(0, 0, 0, xlim = c(-1, 1), ylim = c(-1, 1), zlim = c(-1, 1),
            radius = 1, type = "s", col = "lightblue",
            lit = FALSE)
rgl::points3d(x_belt2, col = rep(c(1,2,3), each=n))

# x_1_belt3 <- rotasym::r_ACG(n, sigma)
x_1_belt3 <- sphunif::r_alt(n = n, p = 3, alt = "SC", kappa = 400, nu = 0.80)[,1]
x_2_belt3 <- x_1_belt3 %*% rotate_mat_90
x_3_belt3 <- x_2_belt3 %*% rotate_mat_45
x_belt3 <- rbind(x_1_belt3, x_2_belt3, x_3_belt3)
scatterplot3d::scatterplot3d(x_belt3, xlim = c(-1, 1),
                             ylim = c(-1, 1), zlim = c(-1, 1),
                             color = rep(c(1,2,3), each=n))

```



```

rgl::plot3d(0, 0, 0, xlim = c(-1, 1), ylim = c(-1, 1), zlim = c(-1, 1),
            radius = 1, type = "s", col = "lightblue",
            lit = FALSE)
rgl::points3d(x_belt3, col = rep(c(1,2,3), each=n))

n <- n * 3
x_5 <- array(dim = c(n, 3, 3))
x_5[, , 1] <- x_belt1
x_5[, , 2] <- x_belt2
x_5[, , 3] <- x_belt3

indexes <- sample(1:n)
x_5 <- x_5[indexes,,]
colors <- rep(c(1, 2, 3), each = n / 3)[indexes]

```

Let's calculate the rho parameters based on a perplexity of 25:

```
rho_five_perp20 <- rho_optim_bst(x_5, 50)
```

```
## Time difference of 9.914337 secs
```

First, let's reduce to dimension  $S^1$  then  $d = 1$  (circumference):

```
res_pscsne <- psc_sne(X=x_5, d=1, rho_psc_list = rho_five_perp20, num_iteration=500,
                        eta = 20, show_prog = TRUE, colors = colors)
```

```
## It: 1; obj: 1.284e+01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.250e-01; mom: 0.000e+00;
## best it: 1; best obj: 1.284e+01
```

```
## It: 2; obj: 1.270e+01; abs: 1.404e-01; rel: 1.094e-02; norm: 1.504e-01; mom: 4.305e-01;
```

```
## best it: 2; best obj: 1.270e+01
```

```
## It: 3; obj: 1.250e+01; abs: 1.964e-01; rel: 1.547e-02; norm: 1.919e-01; mom: 6.696e-01;
```

```
## best it: 3; best obj: 1.250e+01
```

```
## It: 4; obj: 1.226e+01; abs: 2.438e-01; rel: 1.950e-02; norm: 2.466e-01; mom: 8.242e-01;
```

```
## best it: 4; best obj: 1.226e+01
```

```
## It: 5; obj: 1.199e+01; abs: 2.679e-01; rel: 2.186e-02; norm: 3.205e-01; mom: 9.168e-01;
```

```
## best it: 5; best obj: 1.199e+01
```

```

## It: 6; obj: 1.172e+01; abs: 2.715e-01; rel: 2.265e-02; norm: 4.018e-01; mom: 9.725e-01;
## best it: 6; best obj: 1.172e+01
## It: 7; obj: 1.145e+01; abs: 2.655e-01; rel: 2.265e-02; norm: 4.753e-01; mom: 9.870e-01;
## best it: 7; best obj: 1.145e+01
## It: 8; obj: 1.114e+01; abs: 3.151e-01; rel: 2.751e-02; norm: 5.501e-01; mom: 9.249e-01;
## best it: 8; best obj: 1.114e+01
## It: 9; obj: 1.072e+01; abs: 4.142e-01; rel: 3.719e-02; norm: 6.349e-01; mom: 9.404e-01;
## best it: 9; best obj: 1.072e+01
## It: 10; obj: 1.027e+01; abs: 4.589e-01; rel: 4.279e-02; norm: 7.405e-01; mom: 1.002e+00;
## best it: 10; best obj: 1.027e+01
## It: 11; obj: 9.886e+00; abs: 3.798e-01; rel: 3.700e-02; norm: 8.754e-01; mom: 1.070e+00;
## best it: 11; best obj: 9.886e+00
## It: 12; obj: 9.593e+00; abs: 2.923e-01; rel: 2.957e-02; norm: 1.006e+00; mom: 1.062e+00;
## best it: 12; best obj: 9.593e+00
## It: 13; obj: 9.319e+00; abs: 2.747e-01; rel: 2.863e-02; norm: 1.086e+00; mom: 8.937e-01;
## best it: 13; best obj: 9.319e+00
## It: 14; obj: 9.120e+00; abs: 1.986e-01; rel: 2.131e-02; norm: 1.142e+00; mom: 7.994e-01;
## best it: 14; best obj: 9.120e+00
## It: 15; obj: 9.035e+00; abs: 8.490e-02; rel: 9.309e-03; norm: 1.195e+00; mom: 7.050e-01;
## best it: 15; best obj: 9.035e+00
## It: 16; obj: 8.996e+00; abs: 3.929e-02; rel: 4.348e-03; norm: 1.238e+00; mom: 5.609e-01;
## best it: 16; best obj: 8.996e+00
## It: 17; obj: 8.989e+00; abs: 6.909e-03; rel: 7.680e-04; norm: 1.263e+00; mom: 4.313e-01;
## best it: 17; best obj: 8.989e+00
## It: 18; obj: 8.995e+00; abs: 5.526e-03; rel: 6.148e-04; norm: 1.278e+00; mom: 2.886e-01;
## best it: 17; best obj: 8.989e+00
## It: 19; obj: 8.980e+00; abs: 1.460e-02; rel: 1.624e-03; norm: 1.285e+00; mom: 2.220e-01;
## best it: 19; best obj: 8.980e+00
## It: 20; obj: 8.972e+00; abs: 8.419e-03; rel: 9.375e-04; norm: 1.290e+00; mom: 3.172e-01;
## best it: 20; best obj: 8.972e+00
## It: 21; obj: 8.971e+00; abs: 1.172e-04; rel: 1.307e-05; norm: 1.293e+00; mom: 2.540e-01;
## best it: 21; best obj: 8.971e+00
## It: 22; obj: 8.971e+00; abs: 7.463e-04; rel: 8.319e-05; norm: 1.295e+00; mom: 1.222e-01;
## best it: 22; best obj: 8.971e+00
## It: 23; obj: 8.969e+00; abs: 1.588e-03; rel: 1.770e-04; norm: 1.296e+00; mom: 7.654e-02;
## best it: 23; best obj: 8.969e+00
## It: 24; obj: 8.967e+00; abs: 2.073e-03; rel: 2.312e-04; norm: 1.297e+00; mom: 7.313e-02;
## best it: 24; best obj: 8.967e+00
## It: 25; obj: 8.965e+00; abs: 2.429e-03; rel: 2.709e-04; norm: 1.298e+00; mom: 7.161e-02;
## best it: 25; best obj: 8.965e+00

## It: 26; obj: 8.962e+00; abs: 2.676e-03; rel: 2.985e-04; norm: 1.299e+00; mom: 7.240e-02;
## best it: 26; best obj: 8.962e+00
## It: 27; obj: 8.959e+00; abs: 2.829e-03; rel: 3.157e-04; norm: 1.299e+00; mom: 7.446e-02;
## best it: 27; best obj: 8.959e+00
## It: 28; obj: 8.956e+00; abs: 2.887e-03; rel: 3.223e-04; norm: 1.300e+00; mom: 7.684e-02;
## best it: 28; best obj: 8.956e+00
## It: 29; obj: 8.953e+00; abs: 2.843e-03; rel: 3.175e-04; norm: 1.301e+00; mom: 7.920e-02;
## best it: 29; best obj: 8.953e+00
## It: 30; obj: 8.951e+00; abs: 2.697e-03; rel: 3.012e-04; norm: 1.303e+00; mom: 8.138e-02;
## best it: 30; best obj: 8.951e+00
## It: 31; obj: 8.948e+00; abs: 2.459e-03; rel: 2.747e-04; norm: 1.304e+00; mom: 8.339e-02;
## best it: 31; best obj: 8.948e+00
## It: 32; obj: 8.946e+00; abs: 2.144e-03; rel: 2.396e-04; norm: 1.305e+00; mom: 8.533e-02;

```

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## best it: 32; best obj: 8.946e+00
## It: 33; obj: 8.944e+00; abs: 1.763e-03; rel: 1.971e-04; norm: 1.307e+00; mom: 8.736e-02;
## best it: 33; best obj: 8.944e+00
## It: 34; obj: 8.943e+00; abs: 1.319e-03; rel: 1.475e-04; norm: 1.309e+00; mom: 8.959e-02;
## best it: 34; best obj: 8.943e+00
## It: 35; obj: 8.942e+00; abs: 8.084e-04; rel: 9.040e-05; norm: 1.311e+00; mom: 9.207e-02;
## best it: 35; best obj: 8.942e+00
## It: 36; obj: 8.942e+00; abs: 2.202e-04; rel: 2.463e-05; norm: 1.313e+00; mom: 9.478e-02;
## best it: 36; best obj: 8.942e+00
## It: 37; obj: 8.942e+00; abs: 4.585e-04; rel: 5.128e-05; norm: 1.316e+00; mom: 9.770e-02;
## best it: 36; best obj: 8.942e+00
## It: 38; obj: 8.944e+00; abs: 1.242e-03; rel: 1.389e-04; norm: 1.319e+00; mom: 1.008e-01;
## best it: 36; best obj: 8.942e+00
## It: 39; obj: 8.946e+00; abs: 2.143e-03; rel: 2.396e-04; norm: 1.322e+00; mom: 1.040e-01;
## best it: 36; best obj: 8.942e+00
## It: 40; obj: 8.949e+00; abs: 3.165e-03; rel: 3.538e-04; norm: 1.326e+00; mom: 1.075e-01;
## best it: 36; best obj: 8.942e+00
## It: 41; obj: 8.953e+00; abs: 4.278e-03; rel: 4.780e-04; norm: 1.329e+00; mom: 1.112e-01;
## best it: 36; best obj: 8.942e+00
## It: 42; obj: 8.958e+00; abs: 5.185e-03; rel: 5.791e-04; norm: 1.333e+00; mom: 1.158e-01;
## best it: 36; best obj: 8.942e+00
## It: 43; obj: 8.962e+00; abs: 3.666e-03; rel: 4.092e-04; norm: 1.338e+00; mom: 1.230e-01;
## best it: 36; best obj: 8.942e+00
## It: 44; obj: 8.951e+00; abs: 1.076e-02; rel: 1.200e-03; norm: 1.343e+00; mom: 1.473e-01;
## best it: 36; best obj: 8.942e+00
## It: 45; obj: 8.931e+00; abs: 2.072e-02; rel: 2.315e-03; norm: 1.349e+00; mom: 2.343e-01;
## best it: 45; best obj: 8.931e+00
## It: 46; obj: 8.929e+00; abs: 1.362e-03; rel: 1.525e-04; norm: 1.356e+00; mom: 2.988e-01;
## best it: 46; best obj: 8.929e+00
## It: 47; obj: 8.936e+00; abs: 6.615e-03; rel: 7.408e-04; norm: 1.363e+00; mom: 2.121e-01;
## best it: 46; best obj: 8.929e+00
## It: 48; obj: 8.944e+00; abs: 8.425e-03; rel: 9.428e-04; norm: 1.369e+00; mom: 1.283e-01;
## best it: 46; best obj: 8.929e+00
## It: 49; obj: 8.954e+00; abs: 9.816e-03; rel: 1.097e-03; norm: 1.375e+00; mom: 1.150e-01;
## best it: 46; best obj: 8.929e+00
## It: 50; obj: 8.965e+00; abs: 1.129e-02; rel: 1.260e-03; norm: 1.382e+00; mom: 1.157e-01;
## best it: 46; best obj: 8.929e+00

## It: 51; obj: 8.978e+00; abs: 1.284e-02; rel: 1.432e-03; norm: 1.389e+00; mom: 1.166e-01;
## best it: 46; best obj: 8.929e+00
## It: 52; obj: 8.993e+00; abs: 1.452e-02; rel: 1.617e-03; norm: 1.397e+00; mom: 1.176e-01;
## best it: 46; best obj: 8.929e+00
## It: 53; obj: 9.009e+00; abs: 1.632e-02; rel: 1.814e-03; norm: 1.404e+00; mom: 1.185e-01;
## best it: 46; best obj: 8.929e+00
## It: 54; obj: 9.027e+00; abs: 1.824e-02; rel: 2.024e-03; norm: 1.412e+00; mom: 1.193e-01;
## best it: 46; best obj: 8.929e+00
## It: 55; obj: 9.048e+00; abs: 2.027e-02; rel: 2.245e-03; norm: 1.420e+00; mom: 1.201e-01;
## best it: 46; best obj: 8.929e+00
## It: 56; obj: 9.070e+00; abs: 2.239e-02; rel: 2.475e-03; norm: 1.429e+00; mom: 1.213e-01;
## best it: 46; best obj: 8.929e+00
## It: 57; obj: 9.094e+00; abs: 2.457e-02; rel: 2.708e-03; norm: 1.437e+00; mom: 1.236e-01;
## best it: 46; best obj: 8.929e+00
## It: 58; obj: 9.121e+00; abs: 2.672e-02; rel: 2.938e-03; norm: 1.446e+00; mom: 1.277e-01;
## best it: 46; best obj: 8.929e+00

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## It: 59; obj: 9.150e+00; abs: 2.879e-02; rel: 3.156e-03; norm: 1.455e+00; mom: 1.336e-01;
## best it: 46; best obj: 8.929e+00
## It: 60; obj: 9.181e+00; abs: 3.080e-02; rel: 3.366e-03; norm: 1.464e+00; mom: 1.399e-01;
## best it: 46; best obj: 8.929e+00
## It: 61; obj: 9.214e+00; abs: 3.288e-02; rel: 3.581e-03; norm: 1.474e+00; mom: 1.449e-01;
## best it: 46; best obj: 8.929e+00
## It: 62; obj: 9.249e+00; abs: 3.501e-02; rel: 3.800e-03; norm: 1.483e+00; mom: 1.482e-01;
## best it: 46; best obj: 8.929e+00
## It: 63; obj: 9.286e+00; abs: 3.701e-02; rel: 4.001e-03; norm: 1.493e+00; mom: 1.517e-01;
## best it: 46; best obj: 8.929e+00
## It: 64; obj: 9.324e+00; abs: 3.862e-02; rel: 4.159e-03; norm: 1.502e+00; mom: 1.574e-01;
## best it: 46; best obj: 8.929e+00
## It: 65; obj: 9.364e+00; abs: 3.955e-02; rel: 4.242e-03; norm: 1.512e+00; mom: 1.650e-01;
## best it: 46; best obj: 8.929e+00
## It: 66; obj: 9.403e+00; abs: 3.934e-02; rel: 4.201e-03; norm: 1.522e+00; mom: 1.735e-01;
## best it: 46; best obj: 8.929e+00
## It: 67; obj: 9.440e+00; abs: 3.725e-02; rel: 3.961e-03; norm: 1.531e+00; mom: 1.823e-01;
## best it: 46; best obj: 8.929e+00
## It: 68; obj: 9.473e+00; abs: 3.232e-02; rel: 3.423e-03; norm: 1.541e+00; mom: 1.908e-01;
## best it: 46; best obj: 8.929e+00
## It: 69; obj: 9.496e+00; abs: 2.353e-02; rel: 2.484e-03; norm: 1.551e+00; mom: 1.985e-01;
## best it: 46; best obj: 8.929e+00
## It: 70; obj: 9.507e+00; abs: 1.020e-02; rel: 1.074e-03; norm: 1.562e+00; mom: 2.049e-01;
## best it: 46; best obj: 8.929e+00
## It: 71; obj: 9.499e+00; abs: 7.316e-03; rel: 7.696e-04; norm: 1.572e+00; mom: 2.091e-01;
## best it: 46; best obj: 8.929e+00
## It: 72; obj: 9.473e+00; abs: 2.659e-02; rel: 2.799e-03; norm: 1.582e+00; mom: 2.107e-01;
## best it: 46; best obj: 8.929e+00
## It: 73; obj: 9.429e+00; abs: 4.340e-02; rel: 4.582e-03; norm: 1.591e+00; mom: 2.087e-01;
## best it: 46; best obj: 8.929e+00
## It: 74; obj: 9.375e+00; abs: 5.418e-02; rel: 5.746e-03; norm: 1.597e+00; mom: 2.014e-01;
## best it: 46; best obj: 8.929e+00
## It: 75; obj: 9.317e+00; abs: 5.826e-02; rel: 6.214e-03; norm: 1.600e+00; mom: 1.886e-01;
## best it: 46; best obj: 8.929e+00

## It: 76; obj: 9.259e+00; abs: 5.736e-02; rel: 6.157e-03; norm: 1.600e+00; mom: 1.725e-01;
## best it: 46; best obj: 8.929e+00
## It: 77; obj: 9.206e+00; abs: 5.368e-02; rel: 5.797e-03; norm: 1.598e+00; mom: 1.560e-01;
## best it: 46; best obj: 8.929e+00
## It: 78; obj: 9.157e+00; abs: 4.882e-02; rel: 5.303e-03; norm: 1.594e+00; mom: 1.410e-01;
## best it: 46; best obj: 8.929e+00
## It: 79; obj: 9.113e+00; abs: 4.372e-02; rel: 4.775e-03; norm: 1.589e+00; mom: 1.278e-01;
## best it: 46; best obj: 8.929e+00
## It: 80; obj: 9.074e+00; abs: 3.886e-02; rel: 4.264e-03; norm: 1.584e+00; mom: 1.163e-01;
## best it: 46; best obj: 8.929e+00
## It: 81; obj: 9.040e+00; abs: 3.443e-02; rel: 3.794e-03; norm: 1.579e+00; mom: 1.062e-01;
## best it: 46; best obj: 8.929e+00
## It: 82; obj: 9.009e+00; abs: 3.050e-02; rel: 3.374e-03; norm: 1.573e+00; mom: 9.719e-02;
## best it: 46; best obj: 8.929e+00
## It: 83; obj: 8.982e+00; abs: 2.706e-02; rel: 3.004e-03; norm: 1.568e+00; mom: 8.919e-02;
## best it: 46; best obj: 8.929e+00
## It: 84; obj: 8.958e+00; abs: 2.407e-02; rel: 2.680e-03; norm: 1.562e+00; mom: 8.204e-02;
## best it: 46; best obj: 8.929e+00
## It: 85; obj: 8.937e+00; abs: 2.148e-02; rel: 2.398e-03; norm: 1.557e+00; mom: 7.563e-02;

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## best it: 46; best obj: 8.929e+00
## It: 86; obj: 8.918e+00; abs: 1.923e-02; rel: 2.152e-03; norm: 1.552e+00; mom: 6.989e-02;
## best it: 86; best obj: 8.918e+00
## It: 87; obj: 8.900e+00; abs: 1.728e-02; rel: 1.938e-03; norm: 1.547e+00; mom: 6.474e-02;
## best it: 87; best obj: 8.900e+00
## It: 88; obj: 8.885e+00; abs: 1.559e-02; rel: 1.751e-03; norm: 1.542e+00; mom: 6.010e-02;
## best it: 88; best obj: 8.885e+00
## It: 89; obj: 8.871e+00; abs: 1.411e-02; rel: 1.588e-03; norm: 1.538e+00; mom: 5.592e-02;
## best it: 89; best obj: 8.871e+00
## It: 90; obj: 8.858e+00; abs: 1.281e-02; rel: 1.444e-03; norm: 1.533e+00; mom: 5.214e-02;
## best it: 90; best obj: 8.858e+00
## It: 91; obj: 8.846e+00; abs: 1.167e-02; rel: 1.318e-03; norm: 1.529e+00; mom: 4.872e-02;
## best it: 91; best obj: 8.846e+00
## It: 92; obj: 8.835e+00; abs: 1.067e-02; rel: 1.206e-03; norm: 1.525e+00; mom: 4.561e-02;
## best it: 92; best obj: 8.835e+00
## It: 93; obj: 8.826e+00; abs: 9.778e-03; rel: 1.107e-03; norm: 1.522e+00; mom: 4.279e-02;
## best it: 93; best obj: 8.826e+00
## It: 94; obj: 8.817e+00; abs: 8.987e-03; rel: 1.018e-03; norm: 1.518e+00; mom: 4.021e-02;
## best it: 94; best obj: 8.817e+00
## It: 95; obj: 8.808e+00; abs: 8.282e-03; rel: 9.393e-04; norm: 1.515e+00; mom: 3.784e-02;
## best it: 95; best obj: 8.808e+00
## It: 96; obj: 8.801e+00; abs: 7.651e-03; rel: 8.686e-04; norm: 1.511e+00; mom: 3.568e-02;
## best it: 96; best obj: 8.801e+00
## It: 97; obj: 8.794e+00; abs: 7.085e-03; rel: 8.050e-04; norm: 1.508e+00; mom: 3.369e-02;
## best it: 97; best obj: 8.794e+00
## It: 98; obj: 8.787e+00; abs: 6.575e-03; rel: 7.477e-04; norm: 1.505e+00; mom: 3.185e-02;
## best it: 98; best obj: 8.787e+00
## It: 99; obj: 8.781e+00; abs: 6.115e-03; rel: 6.959e-04; norm: 1.502e+00; mom: 3.016e-02;
## best it: 99; best obj: 8.781e+00
## It: 100; obj: 8.775e+00; abs: 5.698e-03; rel: 6.489e-04; norm: 1.500e+00; mom: 2.859e-02;
## best it: 100; best obj: 8.775e+00

## It: 101; obj: 7.979e-01; abs: 7.977e+00; rel: 9.091e-01; norm: 1.166e-01; mom: 2.714e-02;
## best it: 101; best obj: 7.979e-01
## It: 102; obj: 7.872e-01; abs: 1.068e-02; rel: 1.339e-02; norm: 1.145e-01; mom: 1.862e-01;
## best it: 102; best obj: 7.872e-01
## It: 103; obj: 7.779e-01; abs: 9.305e-03; rel: 1.182e-02; norm: 1.120e-01; mom: 2.295e-01;
## best it: 103; best obj: 7.779e-01
## It: 104; obj: 7.701e-01; abs: 7.766e-03; rel: 9.983e-03; norm: 1.097e-01; mom: 2.215e-01;
## best it: 104; best obj: 7.701e-01
## It: 105; obj: 7.635e-01; abs: 6.652e-03; rel: 8.638e-03; norm: 1.080e-01; mom: 1.983e-01;
## best it: 105; best obj: 7.635e-01
## It: 106; obj: 7.575e-01; abs: 5.926e-03; rel: 7.762e-03; norm: 1.069e-01; mom: 1.767e-01;
## best it: 106; best obj: 7.575e-01
## It: 107; obj: 7.522e-01; abs: 5.386e-03; rel: 7.110e-03; norm: 1.062e-01; mom: 1.650e-01;
## best it: 107; best obj: 7.522e-01
## It: 108; obj: 7.473e-01; abs: 4.854e-03; rel: 6.454e-03; norm: 1.059e-01; mom: 1.599e-01;
## best it: 108; best obj: 7.473e-01
## It: 109; obj: 7.430e-01; abs: 4.250e-03; rel: 5.687e-03; norm: 1.058e-01; mom: 1.555e-01;
## best it: 109; best obj: 7.430e-01
## It: 110; obj: 7.394e-01; abs: 3.597e-03; rel: 4.841e-03; norm: 1.057e-01; mom: 1.494e-01;
## best it: 110; best obj: 7.394e-01
## It: 111; obj: 7.365e-01; abs: 2.973e-03; rel: 4.020e-03; norm: 1.056e-01; mom: 1.410e-01;
## best it: 111; best obj: 7.365e-01

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## It: 112; obj: 7.340e-01; abs: 2.447e-03; rel: 3.322e-03; norm: 1.055e-01; mom: 1.306e-01;
## best it: 112; best obj: 7.340e-01
## It: 113; obj: 7.320e-01; abs: 2.054e-03; rel: 2.798e-03; norm: 1.054e-01; mom: 1.192e-01;
## best it: 113; best obj: 7.320e-01
## It: 114; obj: 7.302e-01; abs: 1.804e-03; rel: 2.464e-03; norm: 1.055e-01; mom: 1.080e-01;
## best it: 114; best obj: 7.302e-01
## It: 115; obj: 7.285e-01; abs: 1.696e-03; rel: 2.323e-03; norm: 1.059e-01; mom: 9.776e-02;
## best it: 115; best obj: 7.285e-01
## It: 116; obj: 7.268e-01; abs: 1.726e-03; rel: 2.370e-03; norm: 1.067e-01; mom: 8.909e-02;
## best it: 116; best obj: 7.268e-01
## It: 117; obj: 7.249e-01; abs: 1.875e-03; rel: 2.580e-03; norm: 1.075e-01; mom: 8.480e-02;
## best it: 117; best obj: 7.249e-01
## It: 118; obj: 7.228e-01; abs: 2.080e-03; rel: 2.870e-03; norm: 1.082e-01; mom: 9.188e-02;
## best it: 118; best obj: 7.228e-01
## It: 119; obj: 7.206e-01; abs: 2.230e-03; rel: 3.085e-03; norm: 1.089e-01; mom: 1.028e-01;
## best it: 119; best obj: 7.206e-01
## It: 120; obj: 7.184e-01; abs: 2.205e-03; rel: 3.060e-03; norm: 1.096e-01; mom: 1.119e-01;
## best it: 120; best obj: 7.184e-01
## It: 121; obj: 7.164e-01; abs: 1.969e-03; rel: 2.741e-03; norm: 1.106e-01; mom: 1.157e-01;
## best it: 121; best obj: 7.164e-01
## It: 122; obj: 7.148e-01; abs: 1.594e-03; rel: 2.224e-03; norm: 1.119e-01; mom: 1.126e-01;
## best it: 122; best obj: 7.148e-01
## It: 123; obj: 7.136e-01; abs: 1.197e-03; rel: 1.674e-03; norm: 1.134e-01; mom: 1.033e-01;
## best it: 123; best obj: 7.136e-01
## It: 124; obj: 7.127e-01; abs: 8.623e-04; rel: 1.208e-03; norm: 1.146e-01; mom: 9.022e-02;
## best it: 124; best obj: 7.127e-01
## It: 125; obj: 7.121e-01; abs: 6.169e-04; rel: 8.656e-04; norm: 1.155e-01; mom: 7.627e-02;
## best it: 125; best obj: 7.121e-01
## It: 126; obj: 7.117e-01; abs: 4.502e-04; rel: 6.322e-04; norm: 1.162e-01; mom: 6.359e-02;
## best it: 126; best obj: 7.117e-01
## It: 127; obj: 7.113e-01; abs: 3.399e-04; rel: 4.776e-04; norm: 1.167e-01; mom: 5.323e-02;
## best it: 127; best obj: 7.113e-01
## It: 128; obj: 7.111e-01; abs: 2.658e-04; rel: 3.737e-04; norm: 1.170e-01; mom: 4.533e-02;
## best it: 128; best obj: 7.111e-01
## It: 129; obj: 7.109e-01; abs: 2.140e-04; rel: 3.010e-04; norm: 1.172e-01; mom: 3.950e-02;
## best it: 129; best obj: 7.109e-01
## It: 130; obj: 7.107e-01; abs: 1.758e-04; rel: 2.473e-04; norm: 1.173e-01; mom: 3.518e-02;
## best it: 130; best obj: 7.107e-01
## It: 131; obj: 7.105e-01; abs: 1.462e-04; rel: 2.057e-04; norm: 1.173e-01; mom: 3.188e-02;
## best it: 131; best obj: 7.105e-01
## It: 132; obj: 7.104e-01; abs: 1.225e-04; rel: 1.723e-04; norm: 1.174e-01; mom: 2.919e-02;
## best it: 132; best obj: 7.104e-01
## It: 133; obj: 7.103e-01; abs: 1.029e-04; rel: 1.449e-04; norm: 1.174e-01; mom: 2.688e-02;
## best it: 133; best obj: 7.103e-01
## It: 134; obj: 7.102e-01; abs: 8.671e-05; rel: 1.221e-04; norm: 1.173e-01; mom: 2.481e-02;
## best it: 134; best obj: 7.102e-01
## It: 135; obj: 7.101e-01; abs: 7.314e-05; rel: 1.030e-04; norm: 1.173e-01; mom: 2.292e-02;
## best it: 135; best obj: 7.101e-01
## It: 136; obj: 7.101e-01; abs: 6.177e-05; rel: 8.698e-05; norm: 1.173e-01; mom: 2.118e-02;
## best it: 136; best obj: 7.101e-01
## It: 137; obj: 7.100e-01; abs: 5.222e-05; rel: 7.354e-05; norm: 1.172e-01; mom: 1.957e-02;
## best it: 137; best obj: 7.100e-01
## It: 138; obj: 7.100e-01; abs: 4.421e-05; rel: 6.227e-05; norm: 1.172e-01; mom: 1.808e-02;

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## best it: 138; best obj: 7.100e-01
## It: 139; obj: 7.099e-01; abs: 3.749e-05; rel: 5.280e-05; norm: 1.172e-01; mom: 1.672e-02;
## best it: 139; best obj: 7.099e-01
## It: 140; obj: 7.099e-01; abs: 3.184e-05; rel: 4.484e-05; norm: 1.171e-01; mom: 1.546e-02;
## best it: 140; best obj: 7.099e-01
## It: 141; obj: 7.099e-01; abs: 2.708e-05; rel: 3.814e-05; norm: 1.171e-01; mom: 1.431e-02;
## best it: 141; best obj: 7.099e-01
## It: 142; obj: 7.099e-01; abs: 2.307e-05; rel: 3.249e-05; norm: 1.171e-01; mom: 1.325e-02;
## best it: 142; best obj: 7.099e-01
## It: 143; obj: 7.098e-01; abs: 1.968e-05; rel: 2.772e-05; norm: 1.170e-01; mom: 1.227e-02;
## best it: 143; best obj: 7.098e-01
## It: 144; obj: 7.098e-01; abs: 1.682e-05; rel: 2.369e-05; norm: 1.170e-01; mom: 1.138e-02;
## best it: 144; best obj: 7.098e-01
## It: 145; obj: 7.098e-01; abs: 1.439e-05; rel: 2.027e-05; norm: 1.170e-01; mom: 1.055e-02;
## best it: 145; best obj: 7.098e-01
## It: 146; obj: 7.098e-01; abs: 1.233e-05; rel: 1.737e-05; norm: 1.169e-01; mom: 9.796e-03;
## best it: 146; best obj: 7.098e-01
## It: 147; obj: 7.098e-01; abs: 1.058e-05; rel: 1.490e-05; norm: 1.169e-01; mom: 9.097e-03;
## best it: 147; best obj: 7.098e-01
## It: 148; obj: 7.098e-01; abs: 9.087e-06; rel: 1.280e-05; norm: 1.169e-01; mom: 8.453e-03;
## best it: 148; best obj: 7.098e-01
## It: 149; obj: 7.098e-01; abs: 7.814e-06; rel: 1.101e-05; norm: 1.169e-01; mom: 7.858e-03;
## best it: 149; best obj: 7.098e-01
## It: 150; obj: 7.098e-01; abs: 6.727e-06; rel: 9.477e-06; norm: 1.168e-01; mom: 7.307e-03;
## best it: 150; best obj: 7.098e-01

## It: 151; obj: 7.098e-01; abs: 5.797e-06; rel: 8.167e-06; norm: 1.168e-01; mom: 6.798e-03;
## best it: 151; best obj: 7.098e-01
## It: 152; obj: 7.098e-01; abs: 4.999e-06; rel: 7.044e-06; norm: 1.168e-01; mom: 6.327e-03;
## best it: 152; best obj: 7.098e-01
## It: 153; obj: 7.098e-01; abs: 4.316e-06; rel: 6.080e-06; norm: 1.168e-01; mom: 5.890e-03;
## best it: 153; best obj: 7.098e-01
## It: 154; obj: 7.098e-01; abs: 3.728e-06; rel: 5.253e-06; norm: 1.168e-01; mom: 5.485e-03;
## best it: 154; best obj: 7.098e-01
## It: 155; obj: 7.097e-01; abs: 3.223e-06; rel: 4.541e-06; norm: 1.168e-01; mom: 5.109e-03;
## best it: 155; best obj: 7.097e-01
## It: 156; obj: 7.097e-01; abs: 2.788e-06; rel: 3.928e-06; norm: 1.168e-01; mom: 4.760e-03;
## best it: 156; best obj: 7.097e-01
## It: 157; obj: 7.097e-01; abs: 2.413e-06; rel: 3.400e-06; norm: 1.168e-01; mom: 4.436e-03;
## best it: 157; best obj: 7.097e-01
## It: 158; obj: 7.097e-01; abs: 2.090e-06; rel: 2.944e-06; norm: 1.167e-01; mom: 4.135e-03;
## best it: 158; best obj: 7.097e-01
## It: 159; obj: 7.097e-01; abs: 1.811e-06; rel: 2.551e-06; norm: 1.167e-01; mom: 3.854e-03;
## best it: 159; best obj: 7.097e-01
## It: 160; obj: 7.097e-01; abs: 1.570e-06; rel: 2.212e-06; norm: 1.167e-01; mom: 3.594e-03;
## best it: 160; best obj: 7.097e-01
## It: 161; obj: 7.097e-01; abs: 1.361e-06; rel: 1.918e-06; norm: 1.167e-01; mom: 3.351e-03;
## best it: 161; best obj: 7.097e-01
## It: 162; obj: 7.097e-01; abs: 1.181e-06; rel: 1.664e-06; norm: 1.167e-01; mom: 3.125e-03;
## best it: 162; best obj: 7.097e-01
## It: 163; obj: 7.097e-01; abs: 1.025e-06; rel: 1.444e-06; norm: 1.167e-01; mom: 2.915e-03;
## best it: 163; best obj: 7.097e-01
## It: 164; obj: 7.097e-01; abs: 8.900e-07; rel: 1.254e-06; norm: 1.167e-01; mom: 2.719e-03;
## best it: 164; best obj: 7.097e-01

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## It: 165; obj: 7.097e-01; abs: 7.729e-07; rel: 1.089e-06; norm: 1.167e-01; mom: 2.537e-03;
## best it: 165; best obj: 7.097e-01
## It: 166; obj: 7.097e-01; abs: 6.715e-07; rel: 9.461e-07; norm: 1.167e-01; mom: 2.367e-03;
## best it: 166; best obj: 7.097e-01
## It: 167; obj: 7.097e-01; abs: 5.835e-07; rel: 8.221e-07; norm: 1.167e-01; mom: 2.208e-03;
## best it: 167; best obj: 7.097e-01
## It: 168; obj: 7.097e-01; abs: 5.071e-07; rel: 7.145e-07; norm: 1.167e-01; mom: 2.060e-03;
## best it: 168; best obj: 7.097e-01
## It: 169; obj: 7.097e-01; abs: 4.409e-07; rel: 6.212e-07; norm: 1.167e-01; mom: 1.923e-03;
## best it: 169; best obj: 7.097e-01
## It: 170; obj: 7.097e-01; abs: 3.834e-07; rel: 5.401e-07; norm: 1.167e-01; mom: 1.794e-03;
## best it: 170; best obj: 7.097e-01
## It: 171; obj: 7.097e-01; abs: 3.334e-07; rel: 4.698e-07; norm: 1.167e-01; mom: 1.674e-03;
## best it: 171; best obj: 7.097e-01
## It: 172; obj: 7.097e-01; abs: 2.900e-07; rel: 4.086e-07; norm: 1.167e-01; mom: 1.563e-03;
## best it: 172; best obj: 7.097e-01
## It: 173; obj: 7.097e-01; abs: 2.523e-07; rel: 3.555e-07; norm: 1.167e-01; mom: 1.458e-03;
## best it: 173; best obj: 7.097e-01
## It: 174; obj: 7.097e-01; abs: 2.195e-07; rel: 3.093e-07; norm: 1.167e-01; mom: 1.361e-03;
## best it: 174; best obj: 7.097e-01
## It: 175; obj: 7.097e-01; abs: 1.911e-07; rel: 2.692e-07; norm: 1.167e-01; mom: 1.270e-03;
## best it: 175; best obj: 7.097e-01

## It: 176; obj: 7.097e-01; abs: 1.663e-07; rel: 2.343e-07; norm: 1.167e-01; mom: 1.186e-03;
## best it: 176; best obj: 7.097e-01
## It: 177; obj: 7.097e-01; abs: 1.448e-07; rel: 2.040e-07; norm: 1.167e-01; mom: 1.107e-03;
## best it: 177; best obj: 7.097e-01
## It: 178; obj: 7.097e-01; abs: 1.260e-07; rel: 1.776e-07; norm: 1.167e-01; mom: 1.033e-03;
## best it: 178; best obj: 7.097e-01
## It: 179; obj: 7.097e-01; abs: 1.097e-07; rel: 1.546e-07; norm: 1.167e-01; mom: 9.645e-04;
## best it: 179; best obj: 7.097e-01
## It: 180; obj: 7.097e-01; abs: 9.554e-08; rel: 1.346e-07; norm: 1.167e-01; mom: 9.003e-04;
## best it: 180; best obj: 7.097e-01
## It: 181; obj: 7.097e-01; abs: 8.320e-08; rel: 1.172e-07; norm: 1.167e-01; mom: 8.405e-04;
## best it: 181; best obj: 7.097e-01
## It: 182; obj: 7.097e-01; abs: 7.246e-08; rel: 1.021e-07; norm: 1.167e-01; mom: 7.846e-04;
## best it: 182; best obj: 7.097e-01
## It: 183; obj: 7.097e-01; abs: 6.312e-08; rel: 8.893e-08; norm: 1.167e-01; mom: 7.325e-04;
## best it: 183; best obj: 7.097e-01
## It: 184; obj: 7.097e-01; abs: 5.498e-08; rel: 7.746e-08; norm: 1.167e-01; mom: 6.838e-04;
## best it: 184; best obj: 7.097e-01
## It: 185; obj: 7.097e-01; abs: 4.789e-08; rel: 6.748e-08; norm: 1.167e-01; mom: 6.384e-04;
## best it: 185; best obj: 7.097e-01
## It: 186; obj: 7.097e-01; abs: 4.172e-08; rel: 5.879e-08; norm: 1.167e-01; mom: 5.960e-04;
## best it: 186; best obj: 7.097e-01
## It: 187; obj: 7.097e-01; abs: 3.635e-08; rel: 5.122e-08; norm: 1.167e-01; mom: 5.564e-04;
## best it: 187; best obj: 7.097e-01
## It: 188; obj: 7.097e-01; abs: 3.167e-08; rel: 4.463e-08; norm: 1.167e-01; mom: 5.195e-04;
## best it: 188; best obj: 7.097e-01
## It: 189; obj: 7.097e-01; abs: 2.760e-08; rel: 3.888e-08; norm: 1.167e-01; mom: 4.850e-04;
## best it: 189; best obj: 7.097e-01
## It: 190; obj: 7.097e-01; abs: 2.405e-08; rel: 3.388e-08; norm: 1.167e-01; mom: 4.528e-04;
## best it: 190; best obj: 7.097e-01
## It: 191; obj: 7.097e-01; abs: 2.096e-08; rel: 2.953e-08; norm: 1.167e-01; mom: 4.227e-04;

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## best it: 191; best obj: 7.097e-01
## It: 192; obj: 7.097e-01; abs: 1.826e-08; rel: 2.573e-08; norm: 1.167e-01; mom: 3.947e-04;
## best it: 192; best obj: 7.097e-01
## It: 193; obj: 7.097e-01; abs: 1.592e-08; rel: 2.243e-08; norm: 1.167e-01; mom: 3.685e-04;
## best it: 193; best obj: 7.097e-01
## It: 194; obj: 7.097e-01; abs: 1.387e-08; rel: 1.954e-08; norm: 1.167e-01; mom: 3.441e-04;
## best it: 194; best obj: 7.097e-01
## It: 195; obj: 7.097e-01; abs: 1.209e-08; rel: 1.703e-08; norm: 1.167e-01; mom: 3.212e-04;
## best it: 195; best obj: 7.097e-01
## It: 196; obj: 7.097e-01; abs: 1.054e-08; rel: 1.485e-08; norm: 1.167e-01; mom: 2.999e-04;
## best it: 196; best obj: 7.097e-01
## It: 197; obj: 7.097e-01; abs: 9.185e-09; rel: 1.294e-08; norm: 1.167e-01; mom: 2.800e-04;
## best it: 197; best obj: 7.097e-01
## It: 198; obj: 7.097e-01; abs: 8.007e-09; rel: 1.128e-08; norm: 1.166e-01; mom: 2.615e-04;
## best it: 198; best obj: 7.097e-01
## It: 199; obj: 7.097e-01; abs: 6.979e-09; rel: 9.834e-09; norm: 1.166e-01; mom: 2.441e-04;
## best it: 199; best obj: 7.097e-01
## It: 200; obj: 7.097e-01; abs: 6.084e-09; rel: 8.572e-09; norm: 1.166e-01; mom: 2.280e-04;
## best it: 200; best obj: 7.097e-01

## It: 201; obj: 7.097e-01; abs: 5.304e-09; rel: 7.473e-09; norm: 1.166e-01; mom: 2.128e-04;
## best it: 201; best obj: 7.097e-01
## It: 202; obj: 7.097e-01; abs: 4.624e-09; rel: 6.515e-09; norm: 1.166e-01; mom: 1.987e-04;
## best it: 202; best obj: 7.097e-01
## It: 203; obj: 7.097e-01; abs: 4.031e-09; rel: 5.679e-09; norm: 1.166e-01; mom: 1.856e-04;
## best it: 203; best obj: 7.097e-01
## It: 204; obj: 7.097e-01; abs: 3.514e-09; rel: 4.951e-09; norm: 1.166e-01; mom: 1.733e-04;
## best it: 204; best obj: 7.097e-01
## It: 205; obj: 7.097e-01; abs: 3.064e-09; rel: 4.317e-09; norm: 1.166e-01; mom: 1.618e-04;
## best it: 205; best obj: 7.097e-01
## It: 206; obj: 7.097e-01; abs: 2.671e-09; rel: 3.764e-09; norm: 1.166e-01; mom: 1.511e-04;
## best it: 206; best obj: 7.097e-01
## It: 207; obj: 7.097e-01; abs: 2.329e-09; rel: 3.281e-09; norm: 1.166e-01; mom: 1.411e-04;
## best it: 207; best obj: 7.097e-01
## It: 208; obj: 7.097e-01; abs: 2.031e-09; rel: 2.861e-09; norm: 1.166e-01; mom: 1.317e-04;
## best it: 208; best obj: 7.097e-01
## It: 209; obj: 7.097e-01; abs: 1.770e-09; rel: 2.494e-09; norm: 1.166e-01; mom: 1.230e-04;
## best it: 209; best obj: 7.097e-01
## It: 210; obj: 7.097e-01; abs: 1.544e-09; rel: 2.175e-09; norm: 1.166e-01; mom: 1.148e-04;
## best it: 210; best obj: 7.097e-01
## It: 211; obj: 7.097e-01; abs: 1.346e-09; rel: 1.896e-09; norm: 1.166e-01; mom: 1.072e-04;
## best it: 211; best obj: 7.097e-01
## It: 212; obj: 7.097e-01; abs: 1.174e-09; rel: 1.654e-09; norm: 1.166e-01; mom: 1.001e-04;
## best it: 212; best obj: 7.097e-01
## It: 213; obj: 7.097e-01; abs: 1.023e-09; rel: 1.442e-09; norm: 1.166e-01; mom: 9.350e-05;
## best it: 213; best obj: 7.097e-01
## It: 214; obj: 7.097e-01; abs: 8.923e-10; rel: 1.257e-09; norm: 1.166e-01; mom: 8.730e-05;
## best it: 214; best obj: 7.097e-01
## It: 215; obj: 7.097e-01; abs: 7.781e-10; rel: 1.096e-09; norm: 1.166e-01; mom: 8.152e-05;
## best it: 215; best obj: 7.097e-01
## It: 216; obj: 7.097e-01; abs: 6.784e-10; rel: 9.559e-10; norm: 1.166e-01; mom: 7.612e-05;
## best it: 216; best obj: 7.097e-01
## It: 217; obj: 7.097e-01; abs: 5.916e-10; rel: 8.336e-10; norm: 1.166e-01; mom: 7.108e-05;
## best it: 217; best obj: 7.097e-01

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## It: 218; obj: 7.097e-01; abs: 5.159e-10; rel: 7.269e-10; norm: 1.166e-01; mom: 6.637e-05;
## best it: 218; best obj: 7.097e-01
## It: 219; obj: 7.097e-01; abs: 4.499e-10; rel: 6.339e-10; norm: 1.166e-01; mom: 6.198e-05;
## best it: 219; best obj: 7.097e-01
## It: 220; obj: 7.097e-01; abs: 3.923e-10; rel: 5.528e-10; norm: 1.166e-01; mom: 5.788e-05;
## best it: 220; best obj: 7.097e-01
## It: 221; obj: 7.097e-01; abs: 3.421e-10; rel: 4.820e-10; norm: 1.166e-01; mom: 5.404e-05;
## best it: 221; best obj: 7.097e-01
## It: 222; obj: 7.097e-01; abs: 2.983e-10; rel: 4.203e-10; norm: 1.166e-01; mom: 5.047e-05;
## best it: 222; best obj: 7.097e-01
## It: 223; obj: 7.097e-01; abs: 2.601e-10; rel: 3.665e-10; norm: 1.166e-01; mom: 4.712e-05;
## best it: 223; best obj: 7.097e-01
## It: 224; obj: 7.097e-01; abs: 2.269e-10; rel: 3.196e-10; norm: 1.166e-01; mom: 4.400e-05;
## best it: 224; best obj: 7.097e-01
## It: 225; obj: 7.097e-01; abs: 1.979e-10; rel: 2.788e-10; norm: 1.166e-01; mom: 4.109e-05;
## best it: 225; best obj: 7.097e-01

## It: 226; obj: 7.097e-01; abs: 1.725e-10; rel: 2.431e-10; norm: 1.166e-01; mom: 3.837e-05;
## best it: 226; best obj: 7.097e-01
## It: 227; obj: 7.097e-01; abs: 1.505e-10; rel: 2.120e-10; norm: 1.166e-01; mom: 3.583e-05;
## best it: 227; best obj: 7.097e-01
## It: 228; obj: 7.097e-01; abs: 1.312e-10; rel: 1.849e-10; norm: 1.166e-01; mom: 3.346e-05;
## best it: 228; best obj: 7.097e-01
## It: 229; obj: 7.097e-01; abs: 1.144e-10; rel: 1.612e-10; norm: 1.166e-01; mom: 3.124e-05;
## best it: 229; best obj: 7.097e-01
## It: 230; obj: 7.097e-01; abs: 9.981e-11; rel: 1.406e-10; norm: 1.166e-01; mom: 2.917e-05;
## best it: 230; best obj: 7.097e-01
## It: 231; obj: 7.097e-01; abs: 8.703e-11; rel: 1.226e-10; norm: 1.166e-01; mom: 2.724e-05;
## best it: 231; best obj: 7.097e-01
## It: 232; obj: 7.097e-01; abs: 7.590e-11; rel: 1.069e-10; norm: 1.166e-01; mom: 2.544e-05;
## best it: 232; best obj: 7.097e-01
## It: 233; obj: 7.097e-01; abs: 6.618e-11; rel: 9.325e-11; norm: 1.166e-01; mom: 2.376e-05;
## best it: 233; best obj: 7.097e-01
## It: 234; obj: 7.097e-01; abs: 5.774e-11; rel: 8.135e-11; norm: 1.166e-01; mom: 2.218e-05;
## best it: 234; best obj: 7.097e-01
## It: 235; obj: 7.097e-01; abs: 5.033e-11; rel: 7.091e-11; norm: 1.166e-01; mom: 2.072e-05;
## best it: 235; best obj: 7.097e-01
## It: 236; obj: 7.097e-01; abs: 4.392e-11; rel: 6.189e-11; norm: 1.166e-01; mom: 1.934e-05;
## best it: 236; best obj: 7.097e-01
## It: 237; obj: 7.097e-01; abs: 3.829e-11; rel: 5.395e-11; norm: 1.166e-01; mom: 1.806e-05;
## best it: 237; best obj: 7.097e-01
## It: 238; obj: 7.097e-01; abs: 3.339e-11; rel: 4.705e-11; norm: 1.166e-01; mom: 1.687e-05;
## best it: 238; best obj: 7.097e-01
## It: 239; obj: 7.097e-01; abs: 2.913e-11; rel: 4.105e-11; norm: 1.166e-01; mom: 1.575e-05;
## best it: 239; best obj: 7.097e-01
## It: 240; obj: 7.097e-01; abs: 2.541e-11; rel: 3.580e-11; norm: 1.166e-01; mom: 1.471e-05;
## best it: 240; best obj: 7.097e-01
## It: 241; obj: 7.097e-01; abs: 2.214e-11; rel: 3.120e-11; norm: 1.166e-01; mom: 1.374e-05;
## best it: 241; best obj: 7.097e-01
## It: 242; obj: 7.097e-01; abs: 1.933e-11; rel: 2.724e-11; norm: 1.166e-01; mom: 1.283e-05;
## best it: 242; best obj: 7.097e-01
## It: 243; obj: 7.097e-01; abs: 1.685e-11; rel: 2.374e-11; norm: 1.166e-01; mom: 1.198e-05;
## best it: 243; best obj: 7.097e-01
## It: 244; obj: 7.097e-01; abs: 1.469e-11; rel: 2.070e-11; norm: 1.166e-01; mom: 1.119e-05;

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## best it: 244; best obj: 7.097e-01
## It: 245; obj: 7.097e-01; abs: 1.282e-11; rel: 1.806e-11; norm: 1.166e-01; mom: 1.044e-05;
## best it: 245; best obj: 7.097e-01
## It: 246; obj: 7.097e-01; abs: 1.118e-11; rel: 1.575e-11; norm: 1.166e-01; mom: 9.754e-06;
## best it: 246; best obj: 7.097e-01
## It: 247; obj: 7.097e-01; abs: 9.748e-12; rel: 1.373e-11; norm: 1.166e-01; mom: 9.108e-06;
## best it: 247; best obj: 7.097e-01
## It: 248; obj: 7.097e-01; abs: 1.074e-11; rel: 1.514e-11; norm: 1.166e-01; mom: 1.361e-05;
## best it: 248; best obj: 7.097e-01
## It: 249; obj: 7.097e-01; abs: 1.053e-11; rel: 1.484e-11; norm: 1.166e-01; mom: 1.625e-05;
## best it: 249; best obj: 7.097e-01
## It: 250; obj: 7.097e-01; abs: 9.533e-12; rel: 1.343e-11; norm: 1.166e-01; mom: 1.752e-05;
## best it: 250; best obj: 7.097e-01

## It: 251; obj: 7.097e-01; abs: 8.216e-12; rel: 1.158e-11; norm: 1.166e-01; mom: 1.778e-05;
## best it: 251; best obj: 7.097e-01
## It: 252; obj: 7.097e-01; abs: 6.763e-12; rel: 9.530e-12; norm: 1.166e-01; mom: 1.733e-05;
## best it: 252; best obj: 7.097e-01
## It: 253; obj: 7.097e-01; abs: 5.403e-12; rel: 7.612e-12; norm: 1.166e-01; mom: 1.640e-05;
## best it: 253; best obj: 7.097e-01
## It: 254; obj: 7.097e-01; abs: 4.244e-12; rel: 5.980e-12; norm: 1.166e-01; mom: 1.517e-05;
## best it: 254; best obj: 7.097e-01
## It: 255; obj: 7.097e-01; abs: 3.175e-12; rel: 4.474e-12; norm: 1.166e-01; mom: 1.376e-05;
## best it: 255; best obj: 7.097e-01
## It: 256; obj: 7.097e-01; abs: 2.382e-12; rel: 3.356e-12; norm: 1.166e-01; mom: 1.229e-05;
## best it: 256; best obj: 7.097e-01
## It: 257; obj: 7.097e-01; abs: 1.736e-12; rel: 2.447e-12; norm: 1.166e-01; mom: 1.084e-05;
## best it: 257; best obj: 7.097e-01
## It: 258; obj: 7.097e-01; abs: 1.237e-12; rel: 1.743e-12; norm: 1.166e-01; mom: 9.438e-06;
## best it: 258; best obj: 7.097e-01
## It: 259; obj: 7.097e-01; abs: 8.538e-13; rel: 1.203e-12; norm: 1.166e-01; mom: 8.134e-06;
## best it: 259; best obj: 7.097e-01
## It: 260; obj: 7.097e-01; abs: 5.945e-13; rel: 8.377e-13; norm: 1.166e-01; mom: 6.942e-06;
## best it: 260; best obj: 7.097e-01
## It: 261; obj: 7.097e-01; abs: 4.078e-13; rel: 5.746e-13; norm: 1.166e-01; mom: 5.872e-06;
## best it: 261; best obj: 7.097e-01
## It: 262; obj: 7.097e-01; abs: 2.609e-13; rel: 3.676e-13; norm: 1.166e-01; mom: 4.924e-06;
## best it: 262; best obj: 7.097e-01
## It: 263; obj: 7.097e-01; abs: 1.633e-13; rel: 2.301e-13; norm: 1.166e-01; mom: 4.094e-06;
## best it: 263; best obj: 7.097e-01
## It: 264; obj: 7.097e-01; abs: 1.130e-13; rel: 1.592e-13; norm: 1.166e-01; mom: 3.377e-06;
## best it: 264; best obj: 7.097e-01
## It: 265; obj: 7.097e-01; abs: 7.594e-14; rel: 1.070e-13; norm: 1.166e-01; mom: 2.761e-06;
## best it: 265; best obj: 7.097e-01
## It: 266; obj: 7.097e-01; abs: 2.209e-14; rel: 3.113e-14; norm: 1.166e-01; mom: 2.238e-06;
## best it: 266; best obj: 7.097e-01
## It: 267; obj: 7.097e-01; abs: 3.597e-14; rel: 5.068e-14; norm: 1.166e-01; mom: 1.798e-06;
## best it: 267; best obj: 7.097e-01
## It: 268; obj: 7.097e-01; abs: 1.632e-14; rel: 2.300e-14; norm: 1.166e-01; mom: 1.429e-06;
## best it: 268; best obj: 7.097e-01
## It: 269; obj: 7.097e-01; abs: 6.217e-15; rel: 8.760e-15; norm: 1.166e-01; mom: 1.123e-06;
## best it: 269; best obj: 7.097e-01
## It: 270; obj: 7.097e-01; abs: 8.882e-16; rel: 1.251e-15; norm: 1.166e-01; mom: 8.715e-07;
## best it: 270; best obj: 7.097e-01

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## It: 271; obj: 7.097e-01; abs: 2.376e-14; rel: 3.348e-14; norm: 1.166e-01; mom: 6.667e-07;
## best it: 271; best obj: 7.097e-01
## It: 272; obj: 7.097e-01; abs: 1.843e-14; rel: 2.597e-14; norm: 1.166e-01; mom: 5.016e-07;
## best it: 271; best obj: 7.097e-01
## It: 273; obj: 7.097e-01; abs: 2.554e-15; rel: 3.598e-15; norm: 1.166e-01; mom: 3.698e-07;
## best it: 271; best obj: 7.097e-01
## It: 274; obj: 7.097e-01; abs: 8.327e-15; rel: 1.173e-14; norm: 1.166e-01; mom: 2.659e-07;
## best it: 271; best obj: 7.097e-01
## It: 275; obj: 7.097e-01; abs: 6.883e-15; rel: 9.699e-15; norm: 1.166e-01; mom: 1.848e-07;
## best it: 271; best obj: 7.097e-01

## It: 276; obj: 7.097e-01; abs: 9.881e-15; rel: 1.392e-14; norm: 1.166e-01; mom: 1.225e-07;
## best it: 271; best obj: 7.097e-01
## It: 277; obj: 7.097e-01; abs: 9.992e-15; rel: 1.408e-14; norm: 1.166e-01; mom: 7.546e-08;
## best it: 271; best obj: 7.097e-01
## It: 278; obj: 7.097e-01; abs: 1.077e-14; rel: 1.517e-14; norm: 1.166e-01; mom: 4.120e-08;
## best it: 271; best obj: 7.097e-01
## It: 279; obj: 7.097e-01; abs: 5.329e-15; rel: 7.509e-15; norm: 1.166e-01; mom: 1.925e-08;
## best it: 271; best obj: 7.097e-01
## It: 280; obj: 7.097e-01; abs: 8.993e-15; rel: 1.267e-14; norm: 1.166e-01; mom: 1.356e-08;
## best it: 271; best obj: 7.097e-01
## It: 281; obj: 7.097e-01; abs: 8.993e-15; rel: 1.267e-14; norm: 1.166e-01; mom: 2.113e-08;
## best it: 271; best obj: 7.097e-01
## It: 282; obj: 7.097e-01; abs: 1.843e-14; rel: 2.597e-14; norm: 1.166e-01; mom: 2.758e-08;
## best it: 271; best obj: 7.097e-01
## It: 283; obj: 7.097e-01; abs: 6.328e-15; rel: 8.917e-15; norm: 1.166e-01; mom: 3.142e-08;
## best it: 271; best obj: 7.097e-01
## It: 284; obj: 7.097e-01; abs: 1.332e-15; rel: 1.877e-15; norm: 1.166e-01; mom: 3.307e-08;
## best it: 271; best obj: 7.097e-01
## It: 285; obj: 7.097e-01; abs: 4.108e-15; rel: 5.788e-15; norm: 1.166e-01; mom: 3.311e-08;
## best it: 271; best obj: 7.097e-01
## It: 286; obj: 7.097e-01; abs: 2.887e-15; rel: 4.067e-15; norm: 1.166e-01; mom: 3.199e-08;
## best it: 271; best obj: 7.097e-01
## It: 287; obj: 7.097e-01; abs: 1.110e-16; rel: 1.564e-16; norm: 1.166e-01; mom: 3.010e-08;
## best it: 271; best obj: 7.097e-01
## It: 288; obj: 7.097e-01; abs: 6.772e-15; rel: 9.542e-15; norm: 1.166e-01; mom: 2.772e-08;
## best it: 271; best obj: 7.097e-01
## It: 289; obj: 7.097e-01; abs: 8.216e-15; rel: 1.158e-14; norm: 1.166e-01; mom: 2.507e-08;
## best it: 271; best obj: 7.097e-01
## It: 290; obj: 7.097e-01; abs: 1.354e-14; rel: 1.908e-14; norm: 1.166e-01; mom: 2.234e-08;
## best it: 271; best obj: 7.097e-01
## It: 291; obj: 7.097e-01; abs: 4.441e-16; rel: 6.257e-16; norm: 1.166e-01; mom: 1.965e-08;
## best it: 271; best obj: 7.097e-01
## It: 292; obj: 7.097e-01; abs: 1.321e-14; rel: 1.862e-14; norm: 1.166e-01; mom: 1.709e-08;
## best it: 271; best obj: 7.097e-01
## It: 293; obj: 7.097e-01; abs: 1.776e-15; rel: 2.503e-15; norm: 1.166e-01; mom: 1.471e-08;
## best it: 271; best obj: 7.097e-01
## It: 294; obj: 7.097e-01; abs: 1.443e-15; rel: 2.034e-15; norm: 1.166e-01; mom: 1.254e-08;
## best it: 271; best obj: 7.097e-01
## It: 295; obj: 7.097e-01; abs: 1.110e-16; rel: 1.564e-16; norm: 1.166e-01; mom: 1.059e-08;
## best it: 271; best obj: 7.097e-01
## It: 296; obj: 7.097e-01; abs: 1.554e-15; rel: 2.190e-15; norm: 1.166e-01; mom: 8.860e-09;
## best it: 271; best obj: 7.097e-01
## It: 297; obj: 7.097e-01; abs: 4.441e-16; rel: 6.257e-16; norm: 1.166e-01; mom: 7.351e-09;

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## best it: 271; best obj: 7.097e-01
## It: 298; obj: 7.097e-01; abs: 3.775e-15; rel: 5.319e-15; norm: 1.166e-01; mom: 6.048e-09;
## best it: 271; best obj: 7.097e-01
## It: 299; obj: 7.097e-01; abs: 1.554e-14; rel: 2.190e-14; norm: 1.166e-01; mom: 4.935e-09;
## best it: 271; best obj: 7.097e-01
## It: 300; obj: 7.097e-01; abs: 2.442e-15; rel: 3.441e-15; norm: 1.166e-01; mom: 3.994e-09;
## best it: 271; best obj: 7.097e-01

## It: 301; obj: 7.097e-01; abs: 1.654e-14; rel: 2.331e-14; norm: 1.166e-01; mom: 3.203e-09;
## best it: 271; best obj: 7.097e-01
## It: 302; obj: 7.097e-01; abs: 1.532e-14; rel: 2.159e-14; norm: 1.166e-01; mom: 2.544e-09;
## best it: 271; best obj: 7.097e-01
## It: 303; obj: 7.097e-01; abs: 2.998e-15; rel: 4.224e-15; norm: 1.166e-01; mom: 1.998e-09;
## best it: 271; best obj: 7.097e-01
## It: 304; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 1.549e-09;
## best it: 271; best obj: 7.097e-01
## It: 305; obj: 7.097e-01; abs: 2.220e-16; rel: 3.129e-16; norm: 1.166e-01; mom: 1.184e-09;
## best it: 271; best obj: 7.097e-01
## It: 306; obj: 7.097e-01; abs: 9.659e-15; rel: 1.361e-14; norm: 1.166e-01; mom: 8.900e-10;
## best it: 271; best obj: 7.097e-01
## It: 307; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 6.556e-10;
## best it: 271; best obj: 7.097e-01
## It: 308; obj: 7.097e-01; abs: 1.221e-15; rel: 1.721e-15; norm: 1.166e-01; mom: 4.712e-10;
## best it: 271; best obj: 7.097e-01
## It: 309; obj: 7.097e-01; abs: 7.883e-15; rel: 1.111e-14; norm: 1.166e-01; mom: 3.280e-10;
## best it: 271; best obj: 7.097e-01
## It: 310; obj: 7.097e-01; abs: 8.771e-15; rel: 1.236e-14; norm: 1.166e-01; mom: 2.184e-10;
## best it: 271; best obj: 7.097e-01
## It: 311; obj: 7.097e-01; abs: 2.776e-15; rel: 3.911e-15; norm: 1.166e-01; mom: 1.369e-10;
## best it: 271; best obj: 7.097e-01
## It: 312; obj: 7.097e-01; abs: 9.548e-15; rel: 1.345e-14; norm: 1.166e-01; mom: 8.110e-11;
## best it: 271; best obj: 7.097e-01
## It: 313; obj: 7.097e-01; abs: 2.220e-16; rel: 3.129e-16; norm: 1.166e-01; mom: 5.036e-11;
## best it: 271; best obj: 7.097e-01
## It: 314; obj: 7.097e-01; abs: 5.329e-15; rel: 7.509e-15; norm: 1.166e-01; mom: 3.668e-11;
## best it: 271; best obj: 7.097e-01
## It: 315; obj: 7.097e-01; abs: 3.331e-16; rel: 4.693e-16; norm: 1.166e-01; mom: 4.454e-11;
## best it: 271; best obj: 7.097e-01
## It: 316; obj: 7.097e-01; abs: 9.104e-15; rel: 1.283e-14; norm: 1.166e-01; mom: 5.413e-11;
## best it: 271; best obj: 7.097e-01
## It: 317; obj: 7.097e-01; abs: 8.882e-15; rel: 1.251e-14; norm: 1.166e-01; mom: 5.959e-11;
## best it: 271; best obj: 7.097e-01
## It: 318; obj: 7.097e-01; abs: 6.550e-15; rel: 9.229e-15; norm: 1.166e-01; mom: 6.147e-11;
## best it: 271; best obj: 7.097e-01
## It: 319; obj: 7.097e-01; abs: 1.110e-14; rel: 1.564e-14; norm: 1.166e-01; mom: 6.076e-11;
## best it: 271; best obj: 7.097e-01
## It: 320; obj: 7.097e-01; abs: 2.998e-15; rel: 4.224e-15; norm: 1.166e-01; mom: 5.829e-11;
## best it: 271; best obj: 7.097e-01
## It: 321; obj: 7.097e-01; abs: 8.882e-15; rel: 1.251e-14; norm: 1.166e-01; mom: 5.465e-11;
## best it: 271; best obj: 7.097e-01
## It: 322; obj: 7.097e-01; abs: 5.884e-15; rel: 8.291e-15; norm: 1.166e-01; mom: 5.027e-11;
## best it: 271; best obj: 7.097e-01
## It: 323; obj: 7.097e-01; abs: 1.554e-15; rel: 2.190e-15; norm: 1.166e-01; mom: 4.546e-11;
## best it: 271; best obj: 7.097e-01

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## It: 324; obj: 7.097e-01; abs: 8.882e-16; rel: 1.251e-15; norm: 1.166e-01; mom: 4.049e-11;
## best it: 271; best obj: 7.097e-01
## It: 325; obj: 7.097e-01; abs: 4.996e-15; rel: 7.039e-15; norm: 1.166e-01; mom: 3.557e-11;
## best it: 271; best obj: 7.097e-01

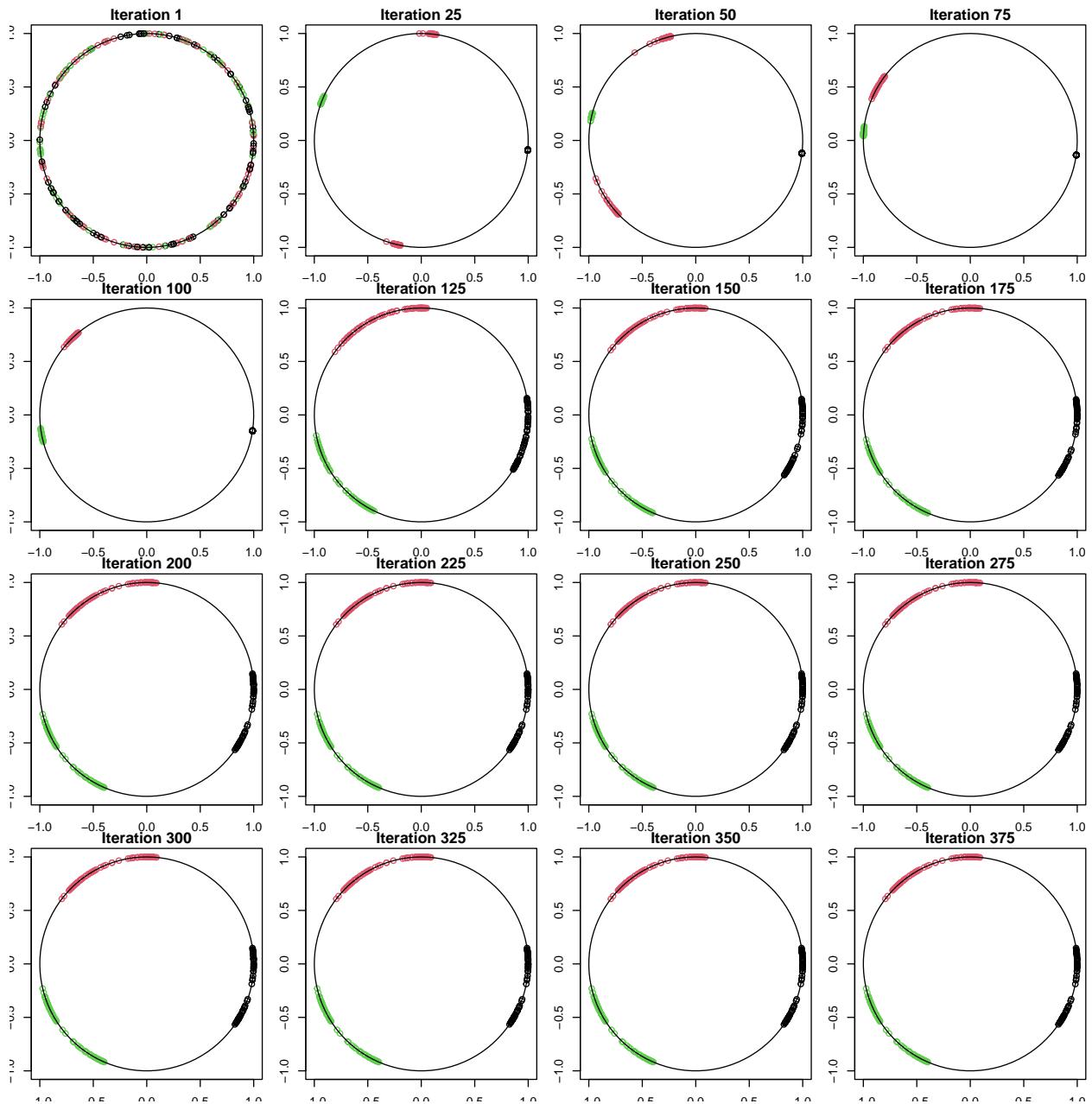
## It: 326; obj: 7.097e-01; abs: 1.088e-14; rel: 1.533e-14; norm: 1.166e-01; mom: 3.087e-11;
## best it: 271; best obj: 7.097e-01
## It: 327; obj: 7.097e-01; abs: 1.332e-15; rel: 1.877e-15; norm: 1.166e-01; mom: 2.651e-11;
## best it: 271; best obj: 7.097e-01
## It: 328; obj: 7.097e-01; abs: 5.440e-15; rel: 7.665e-15; norm: 1.166e-01; mom: 2.254e-11;
## best it: 271; best obj: 7.097e-01
## It: 329; obj: 7.097e-01; abs: 1.033e-14; rel: 1.455e-14; norm: 1.166e-01; mom: 1.900e-11;
## best it: 271; best obj: 7.097e-01
## It: 330; obj: 7.097e-01; abs: 4.774e-15; rel: 6.726e-15; norm: 1.166e-01; mom: 1.587e-11;
## best it: 271; best obj: 7.097e-01
## It: 331; obj: 7.097e-01; abs: 2.220e-16; rel: 3.129e-16; norm: 1.166e-01; mom: 1.314e-11;
## best it: 271; best obj: 7.097e-01
## It: 332; obj: 7.097e-01; abs: 6.772e-15; rel: 9.542e-15; norm: 1.166e-01; mom: 1.079e-11;
## best it: 271; best obj: 7.097e-01
## It: 333; obj: 7.097e-01; abs: 3.331e-15; rel: 4.693e-15; norm: 1.166e-01; mom: 8.781e-12;
## best it: 271; best obj: 7.097e-01
## It: 334; obj: 7.097e-01; abs: 4.885e-15; rel: 6.883e-15; norm: 1.166e-01; mom: 7.090e-12;
## best it: 271; best obj: 7.097e-01
## It: 335; obj: 7.097e-01; abs: 3.997e-15; rel: 5.631e-15; norm: 1.166e-01; mom: 5.679e-12;
## best it: 271; best obj: 7.097e-01
## It: 336; obj: 7.097e-01; abs: 4.219e-15; rel: 5.944e-15; norm: 1.166e-01; mom: 4.511e-12;
## best it: 271; best obj: 7.097e-01
## It: 337; obj: 7.097e-01; abs: 1.110e-16; rel: 1.564e-16; norm: 1.166e-01; mom: 3.548e-12;
## best it: 271; best obj: 7.097e-01
## It: 338; obj: 7.097e-01; abs: 3.664e-15; rel: 5.162e-15; norm: 1.166e-01; mom: 2.755e-12;
## best it: 271; best obj: 7.097e-01
## It: 339; obj: 7.097e-01; abs: 3.442e-15; rel: 4.849e-15; norm: 1.166e-01; mom: 2.107e-12;
## best it: 271; best obj: 7.097e-01
## It: 340; obj: 7.097e-01; abs: 1.221e-15; rel: 1.721e-15; norm: 1.166e-01; mom: 1.581e-12;
## best it: 271; best obj: 7.097e-01
## It: 341; obj: 7.097e-01; abs: 3.553e-15; rel: 5.006e-15; norm: 1.166e-01; mom: 1.162e-12;
## best it: 271; best obj: 7.097e-01
## It: 342; obj: 7.097e-01; abs: 1.665e-15; rel: 2.346e-15; norm: 1.166e-01; mom: 8.345e-13;
## best it: 271; best obj: 7.097e-01
## It: 343; obj: 7.097e-01; abs: 2.554e-15; rel: 3.598e-15; norm: 1.166e-01; mom: 5.842e-13;
## best it: 271; best obj: 7.097e-01
## It: 344; obj: 7.097e-01; abs: 1.332e-15; rel: 1.877e-15; norm: 1.166e-01; mom: 3.974e-13;
## best it: 271; best obj: 7.097e-01
## It: 345; obj: 7.097e-01; abs: 9.992e-16; rel: 1.408e-15; norm: 1.166e-01; mom: 2.633e-13;
## best it: 271; best obj: 7.097e-01
## It: 346; obj: 7.097e-01; abs: 6.661e-16; rel: 9.386e-16; norm: 1.166e-01; mom: 1.746e-13;
## best it: 271; best obj: 7.097e-01
## It: 347; obj: 7.097e-01; abs: 8.882e-16; rel: 1.251e-15; norm: 1.166e-01; mom: 1.202e-13;
## best it: 271; best obj: 7.097e-01
## It: 348; obj: 7.097e-01; abs: 4.441e-16; rel: 6.257e-16; norm: 1.166e-01; mom: 9.034e-14;
## best it: 271; best obj: 7.097e-01
## It: 349; obj: 7.097e-01; abs: 1.776e-15; rel: 2.503e-15; norm: 1.166e-01; mom: 9.206e-14;
## best it: 271; best obj: 7.097e-01
## It: 350; obj: 7.097e-01; abs: 2.220e-16; rel: 3.129e-16; norm: 1.166e-01; mom: 1.058e-13;

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## best it: 271; best obj: 7.097e-01
## It: 351; obj: 7.097e-01; abs: 9.992e-16; rel: 1.408e-15; norm: 1.166e-01; mom: 1.141e-13;
## best it: 271; best obj: 7.097e-01
## It: 352; obj: 7.097e-01; abs: 5.551e-16; rel: 7.821e-16; norm: 1.166e-01; mom: 1.158e-13;
## best it: 271; best obj: 7.097e-01
## It: 353; obj: 7.097e-01; abs: 8.882e-16; rel: 1.251e-15; norm: 1.166e-01; mom: 1.128e-13;
## best it: 271; best obj: 7.097e-01
## It: 354; obj: 7.097e-01; abs: 9.992e-16; rel: 1.408e-15; norm: 1.166e-01; mom: 1.068e-13;
## best it: 271; best obj: 7.097e-01
## It: 355; obj: 7.097e-01; abs: 6.661e-16; rel: 9.386e-16; norm: 1.166e-01; mom: 9.920e-14;
## best it: 271; best obj: 7.097e-01
## It: 356; obj: 7.097e-01; abs: 9.992e-16; rel: 1.408e-15; norm: 1.166e-01; mom: 9.084e-14;
## best it: 271; best obj: 7.097e-01
## It: 357; obj: 7.097e-01; abs: 1.221e-15; rel: 1.721e-15; norm: 1.166e-01; mom: 8.218e-14;
## best it: 271; best obj: 7.097e-01
## It: 358; obj: 7.097e-01; abs: 4.441e-16; rel: 6.257e-16; norm: 1.166e-01; mom: 7.334e-14;
## best it: 271; best obj: 7.097e-01
## It: 359; obj: 7.097e-01; abs: 2.220e-16; rel: 3.129e-16; norm: 1.166e-01; mom: 6.460e-14;
## best it: 271; best obj: 7.097e-01
## It: 360; obj: 7.097e-01; abs: 7.772e-16; rel: 1.095e-15; norm: 1.166e-01; mom: 5.603e-14;
## best it: 271; best obj: 7.097e-01
## It: 361; obj: 7.097e-01; abs: 5.551e-16; rel: 7.821e-16; norm: 1.166e-01; mom: 4.799e-14;
## best it: 271; best obj: 7.097e-01
## It: 362; obj: 7.097e-01; abs: 2.220e-16; rel: 3.129e-16; norm: 1.166e-01; mom: 4.065e-14;
## best it: 271; best obj: 7.097e-01
## It: 363; obj: 7.097e-01; abs: 8.882e-16; rel: 1.251e-15; norm: 1.166e-01; mom: 3.417e-14;
## best it: 271; best obj: 7.097e-01
## It: 364; obj: 7.097e-01; abs: 4.441e-16; rel: 6.257e-16; norm: 1.166e-01; mom: 2.856e-14;
## best it: 271; best obj: 7.097e-01
## It: 365; obj: 7.097e-01; abs: 3.331e-16; rel: 4.693e-16; norm: 1.166e-01; mom: 2.363e-14;
## best it: 271; best obj: 7.097e-01
## It: 366; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 1.938e-14;
## best it: 271; best obj: 7.097e-01
## It: 367; obj: 7.097e-01; abs: 1.110e-16; rel: 1.564e-16; norm: 1.166e-01; mom: 1.575e-14;
## best it: 271; best obj: 7.097e-01
## It: 368; obj: 7.097e-01; abs: 3.331e-16; rel: 4.693e-16; norm: 1.166e-01; mom: 1.266e-14;
## best it: 271; best obj: 7.097e-01
## It: 369; obj: 7.097e-01; abs: 1.110e-16; rel: 1.564e-16; norm: 1.166e-01; mom: 1.011e-14;
## best it: 271; best obj: 7.097e-01
## It: 370; obj: 7.097e-01; abs: 1.110e-16; rel: 1.564e-16; norm: 1.166e-01; mom: 8.010e-15;
## best it: 271; best obj: 7.097e-01
## It: 371; obj: 7.097e-01; abs: 2.220e-16; rel: 3.129e-16; norm: 1.166e-01; mom: 6.296e-15;
## best it: 271; best obj: 7.097e-01
## It: 372; obj: 7.097e-01; abs: 2.220e-16; rel: 3.129e-16; norm: 1.166e-01; mom: 4.989e-15;
## best it: 271; best obj: 7.097e-01
## It: 373; obj: 7.097e-01; abs: 1.110e-16; rel: 1.564e-16; norm: 1.166e-01; mom: 3.893e-15;
## best it: 271; best obj: 7.097e-01
## It: 374; obj: 7.097e-01; abs: 1.110e-16; rel: 1.564e-16; norm: 1.166e-01; mom: 3.018e-15;
## best it: 271; best obj: 7.097e-01
## It: 375; obj: 7.097e-01; abs: 1.110e-16; rel: 1.564e-16; norm: 1.166e-01; mom: 2.323e-15;
## best it: 271; best obj: 7.097e-01

```



```

## It: 376; obj: 7.097e-01; abs: 1.110e-16; rel: 1.564e-16; norm: 1.166e-01; mom: 1.833e-15;
## best it: 271; best obj: 7.097e-01
## It: 377; obj: 7.097e-01; abs: 1.110e-16; rel: 1.564e-16; norm: 1.166e-01; mom: 1.462e-15;
## best it: 271; best obj: 7.097e-01
## It: 378; obj: 7.097e-01; abs: 1.110e-16; rel: 1.564e-16; norm: 1.166e-01; mom: 1.185e-15;
## best it: 271; best obj: 7.097e-01
## It: 379; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 1.059e-15;
## best it: 271; best obj: 7.097e-01
## It: 380; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 1.015e-15;
## best it: 271; best obj: 7.097e-01
## It: 381; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 9.717e-16;
## best it: 271; best obj: 7.097e-01
## It: 382; obj: 7.097e-01; abs: 1.110e-16; rel: 1.564e-16; norm: 1.166e-01; mom: 1.051e-15;
## best it: 271; best obj: 7.097e-01

```





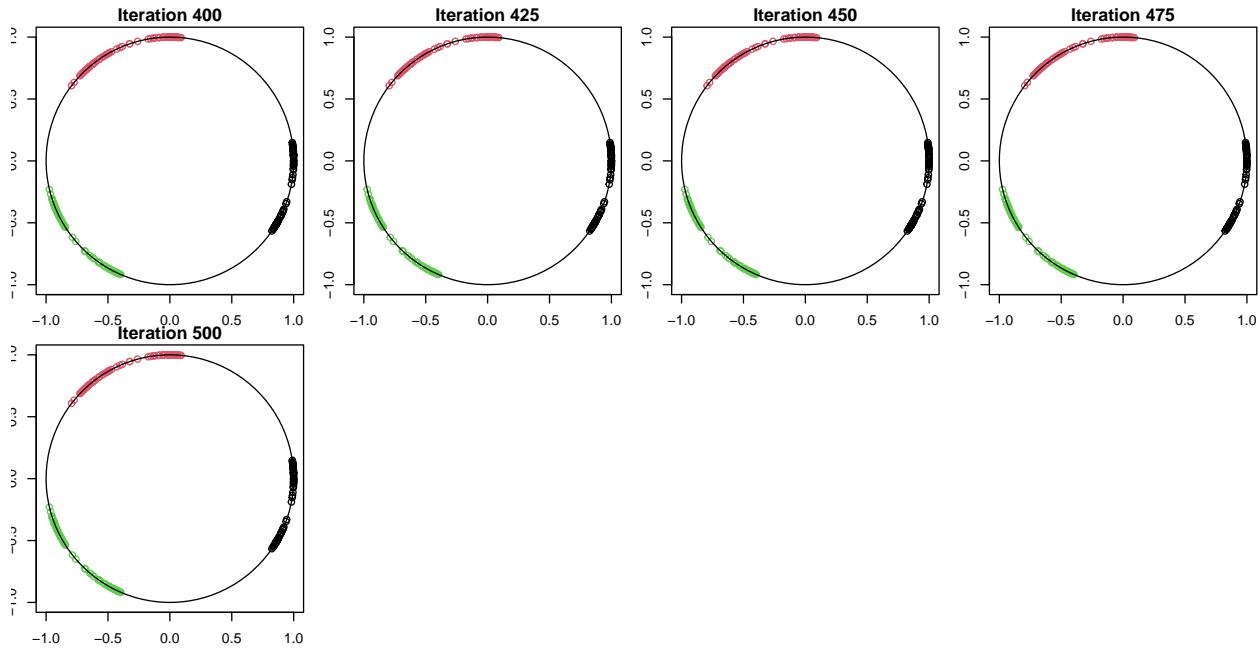




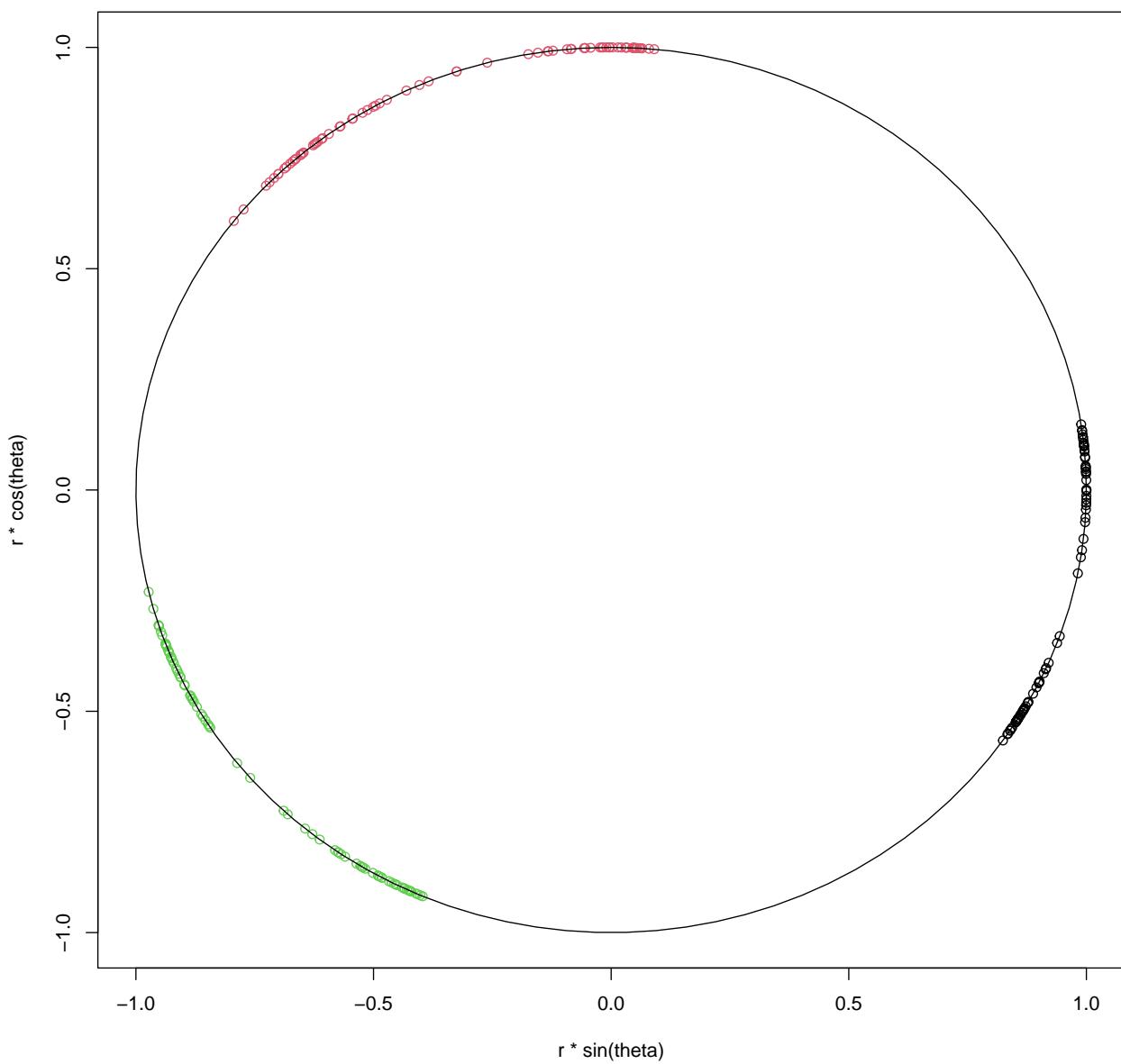
```

## It: 489; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 8.046e-16;
## best it: 271; best obj: 7.097e-01
## It: 490; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 7.595e-16;
## best it: 271; best obj: 7.097e-01
## It: 491; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 8.900e-16;
## best it: 271; best obj: 7.097e-01
## It: 492; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 8.411e-16;
## best it: 271; best obj: 7.097e-01
## It: 493; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 8.380e-16;
## best it: 271; best obj: 7.097e-01
## It: 494; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 7.692e-16;
## best it: 271; best obj: 7.097e-01
## It: 495; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 8.218e-16;
## best it: 271; best obj: 7.097e-01
## It: 496; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 8.531e-16;
## best it: 271; best obj: 7.097e-01
## It: 497; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 7.439e-16;
## best it: 271; best obj: 7.097e-01
## It: 498; obj: 7.097e-01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.166e-01; mom: 8.924e-16;
## best it: 271; best obj: 7.097e-01
## It: 499; obj: 7.097e-01; abs: 1.110e-16; rel: 1.564e-16; norm: 1.166e-01; mom: 9.405e-16;
## best it: 271; best obj: 7.097e-01
## It: 500; obj: 7.097e-01; abs: 2.220e-16; rel: 3.129e-16; norm: 1.166e-01; mom: 8.385e-16;
## best it: 271; best obj: 7.097e-01

```



### Iteration 271



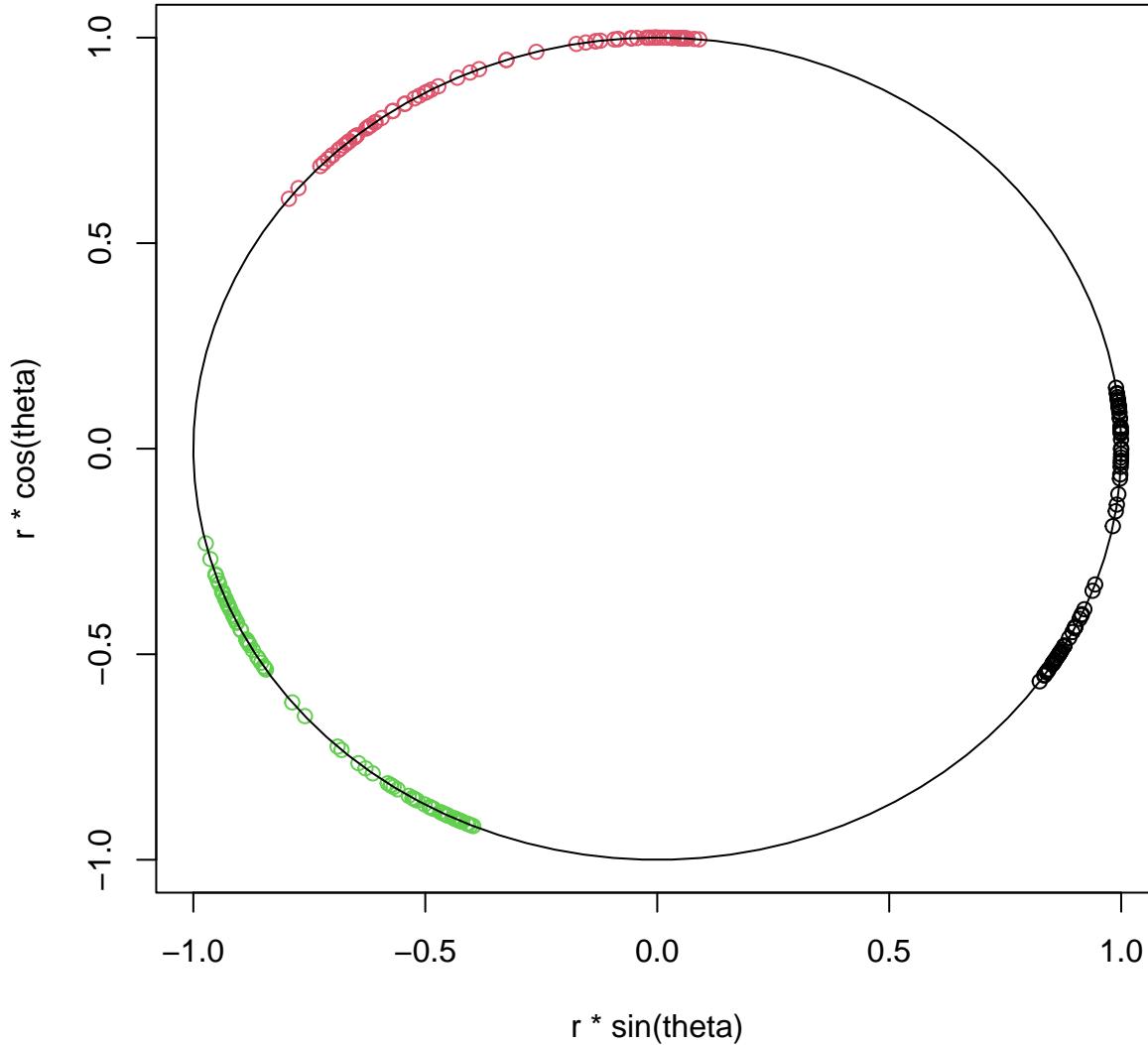
```

Y <- res_pscsne$best_Y

Y_rad <- DirStats::to_rad(Y)
r <- 1
theta <- Y_rad
plot(r*sin(theta),
     r*cos(theta),
     col=colors,
     xlim=c(-max(r),max(r)),
     ylim=c(-max(r),max(r)))

polygon(max(r)*sin(seq(0,2*pi,length.out=100)),max(r)*cos(seq(0,2*pi,length.out=100)))

```



Now we are going to reduce to dimension  $\mathbb{S}^2$  then  $d = 2$  (sphere):

```
res_pscsne <- psc_sne(X=x_5, d=2, rho_psc_list = rho_five_perp20,
                        num_iteration=500, eta = 400, show_prog = TRUE,
                        colors = colors)

## It: 1; obj: 1.275e+01; abs: 0.000e+00; rel: 0.000e+00; norm: 1.405e-01; mom: 0.000e+00;
## best it: 1; best obj: 1.275e+01

## It: 2; obj: 8.117e+00; abs: 4.630e+00; rel: 3.632e-01; norm: 5.028e-01; mom: 7.234e+00;
## best it: 2; best obj: 8.117e+00
## It: 3; obj: 7.320e+00; abs: 7.966e-01; rel: 9.815e-02; norm: 1.492e+00; mom: 4.938e+00;
## best it: 3; best obj: 7.320e+00
## It: 4; obj: 7.384e+00; abs: 6.401e-02; rel: 8.745e-03; norm: 2.017e+00; mom: 1.605e+00;
## best it: 3; best obj: 7.320e+00
## It: 5; obj: 7.522e+00; abs: 1.383e-01; rel: 1.872e-02; norm: 2.249e+00; mom: 7.273e-01;
## best it: 3; best obj: 7.320e+00
## It: 6; obj: 7.655e+00; abs: 1.332e-01; rel: 1.770e-02; norm: 2.382e+00; mom: 5.350e-01;
## best it: 3; best obj: 7.320e+00
## It: 7; obj: 7.756e+00; abs: 1.005e-01; rel: 1.313e-02; norm: 2.461e+00; mom: 3.906e-01;
## best it: 3; best obj: 7.320e+00
## It: 8; obj: 7.821e+00; abs: 6.475e-02; rel: 8.348e-03; norm: 2.506e+00; mom: 2.718e-01;
```

```

## best it: 3; best obj: 7.320e+00
## It: 9; obj: 7.860e+00; abs: 3.893e-02; rel: 4.978e-03; norm: 2.535e+00; mom: 1.898e-01;
## best it: 3; best obj: 7.320e+00
## It: 10; obj: 7.882e+00; abs: 2.276e-02; rel: 2.896e-03; norm: 2.555e+00; mom: 1.381e-01;
## best it: 3; best obj: 7.320e+00
## It: 11; obj: 7.895e+00; abs: 1.308e-02; rel: 1.659e-03; norm: 2.571e+00; mom: 1.047e-01;
## best it: 3; best obj: 7.320e+00
## It: 12; obj: 7.903e+00; abs: 7.397e-03; rel: 9.368e-04; norm: 2.585e+00; mom: 8.233e-02;
## best it: 3; best obj: 7.320e+00
## It: 13; obj: 7.907e+00; abs: 4.125e-03; rel: 5.220e-04; norm: 2.598e+00; mom: 6.754e-02;
## best it: 3; best obj: 7.320e+00
## It: 14; obj: 7.909e+00; abs: 2.304e-03; rel: 2.915e-04; norm: 2.610e+00; mom: 5.834e-02;
## best it: 3; best obj: 7.320e+00
## It: 15; obj: 7.911e+00; abs: 1.358e-03; rel: 1.717e-04; norm: 2.622e+00; mom: 5.321e-02;
## best it: 3; best obj: 7.320e+00
## It: 16; obj: 7.912e+00; abs: 9.370e-04; rel: 1.184e-04; norm: 2.633e+00; mom: 5.066e-02;
## best it: 3; best obj: 7.320e+00
## It: 17; obj: 7.912e+00; abs: 8.306e-04; rel: 1.050e-04; norm: 2.645e+00; mom: 4.941e-02;
## best it: 3; best obj: 7.320e+00
## It: 18; obj: 7.913e+00; abs: 9.111e-04; rel: 1.151e-04; norm: 2.656e+00; mom: 4.874e-02;
## best it: 3; best obj: 7.320e+00
## It: 19; obj: 7.914e+00; abs: 1.101e-03; rel: 1.391e-04; norm: 2.667e+00; mom: 4.830e-02;
## best it: 3; best obj: 7.320e+00
## It: 20; obj: 7.916e+00; abs: 1.354e-03; rel: 1.710e-04; norm: 2.678e+00; mom: 4.795e-02;
## best it: 3; best obj: 7.320e+00
## It: 21; obj: 7.917e+00; abs: 1.640e-03; rel: 2.072e-04; norm: 2.689e+00; mom: 4.760e-02;
## best it: 3; best obj: 7.320e+00
## It: 22; obj: 7.919e+00; abs: 1.944e-03; rel: 2.456e-04; norm: 2.700e+00; mom: 4.723e-02;
## best it: 3; best obj: 7.320e+00
## It: 23; obj: 7.922e+00; abs: 2.254e-03; rel: 2.847e-04; norm: 2.710e+00; mom: 4.681e-02;
## best it: 3; best obj: 7.320e+00
## It: 24; obj: 7.924e+00; abs: 2.564e-03; rel: 3.236e-04; norm: 2.721e+00; mom: 4.633e-02;
## best it: 3; best obj: 7.320e+00
## It: 25; obj: 7.927e+00; abs: 2.867e-03; rel: 3.618e-04; norm: 2.731e+00; mom: 4.577e-02;
## best it: 3; best obj: 7.320e+00
## It: 26; obj: 7.930e+00; abs: 3.161e-03; rel: 3.988e-04; norm: 2.741e+00; mom: 4.513e-02;
## best it: 3; best obj: 7.320e+00
## It: 27; obj: 7.934e+00; abs: 3.442e-03; rel: 4.340e-04; norm: 2.751e+00; mom: 4.441e-02;
## best it: 3; best obj: 7.320e+00
## It: 28; obj: 7.937e+00; abs: 3.707e-03; rel: 4.673e-04; norm: 2.761e+00; mom: 4.360e-02;
## best it: 3; best obj: 7.320e+00
## It: 29; obj: 7.941e+00; abs: 3.954e-03; rel: 4.982e-04; norm: 2.770e+00; mom: 4.271e-02;
## best it: 3; best obj: 7.320e+00
## It: 30; obj: 7.945e+00; abs: 4.181e-03; rel: 5.264e-04; norm: 2.779e+00; mom: 4.174e-02;
## best it: 3; best obj: 7.320e+00
## It: 31; obj: 7.950e+00; abs: 4.384e-03; rel: 5.517e-04; norm: 2.788e+00; mom: 4.069e-02;
## best it: 3; best obj: 7.320e+00
## It: 32; obj: 7.954e+00; abs: 4.561e-03; rel: 5.738e-04; norm: 2.796e+00; mom: 3.957e-02;
## best it: 3; best obj: 7.320e+00
## It: 33; obj: 7.959e+00; abs: 4.712e-03; rel: 5.924e-04; norm: 2.804e+00; mom: 3.838e-02;
## best it: 3; best obj: 7.320e+00
## It: 34; obj: 7.964e+00; abs: 4.834e-03; rel: 6.074e-04; norm: 2.812e+00; mom: 3.714e-02;
## best it: 3; best obj: 7.320e+00

```

```

## It: 35; obj: 7.969e+00; abs: 4.927e-03; rel: 6.187e-04; norm: 2.820e+00; mom: 3.584e-02;
## best it: 3; best obj: 7.320e+00
## It: 36; obj: 7.974e+00; abs: 4.991e-03; rel: 6.263e-04; norm: 2.827e+00; mom: 3.451e-02;
## best it: 3; best obj: 7.320e+00
## It: 37; obj: 7.979e+00; abs: 5.025e-03; rel: 6.302e-04; norm: 2.834e+00; mom: 3.314e-02;
## best it: 3; best obj: 7.320e+00
## It: 38; obj: 7.984e+00; abs: 5.031e-03; rel: 6.305e-04; norm: 2.841e+00; mom: 3.174e-02;
## best it: 3; best obj: 7.320e+00
## It: 39; obj: 7.989e+00; abs: 5.008e-03; rel: 6.273e-04; norm: 2.847e+00; mom: 3.033e-02;
## best it: 3; best obj: 7.320e+00
## It: 40; obj: 7.994e+00; abs: 4.960e-03; rel: 6.208e-04; norm: 2.853e+00; mom: 2.891e-02;
## best it: 3; best obj: 7.320e+00
## It: 41; obj: 7.999e+00; abs: 4.887e-03; rel: 6.113e-04; norm: 2.858e+00; mom: 2.750e-02;
## best it: 3; best obj: 7.320e+00
## It: 42; obj: 8.004e+00; abs: 4.791e-03; rel: 5.990e-04; norm: 2.864e+00; mom: 2.609e-02;
## best it: 3; best obj: 7.320e+00
## It: 43; obj: 8.008e+00; abs: 4.677e-03; rel: 5.843e-04; norm: 2.869e+00; mom: 2.471e-02;
## best it: 3; best obj: 7.320e+00
## It: 44; obj: 8.013e+00; abs: 4.544e-03; rel: 5.675e-04; norm: 2.874e+00; mom: 2.335e-02;
## best it: 3; best obj: 7.320e+00
## It: 45; obj: 8.017e+00; abs: 4.398e-03; rel: 5.488e-04; norm: 2.878e+00; mom: 2.202e-02;
## best it: 3; best obj: 7.320e+00
## It: 46; obj: 8.021e+00; abs: 4.239e-03; rel: 5.287e-04; norm: 2.882e+00; mom: 2.073e-02;
## best it: 3; best obj: 7.320e+00
## It: 47; obj: 8.025e+00; abs: 4.071e-03; rel: 5.075e-04; norm: 2.886e+00; mom: 1.948e-02;
## best it: 3; best obj: 7.320e+00
## It: 48; obj: 8.029e+00; abs: 3.895e-03; rel: 4.854e-04; norm: 2.890e+00; mom: 1.827e-02;
## best it: 3; best obj: 7.320e+00
## It: 49; obj: 8.033e+00; abs: 3.715e-03; rel: 4.627e-04; norm: 2.893e+00; mom: 1.711e-02;
## best it: 3; best obj: 7.320e+00
## It: 50; obj: 8.037e+00; abs: 3.532e-03; rel: 4.397e-04; norm: 2.896e+00; mom: 1.601e-02;
## best it: 3; best obj: 7.320e+00
## It: 51; obj: 8.040e+00; abs: 3.349e-03; rel: 4.167e-04; norm: 2.899e+00; mom: 1.495e-02;
## best it: 3; best obj: 7.320e+00
## It: 52; obj: 8.043e+00; abs: 3.166e-03; rel: 3.938e-04; norm: 2.902e+00; mom: 1.395e-02;
## best it: 3; best obj: 7.320e+00
## It: 53; obj: 8.046e+00; abs: 2.986e-03; rel: 3.712e-04; norm: 2.905e+00; mom: 1.301e-02;
## best it: 3; best obj: 7.320e+00
## It: 54; obj: 8.049e+00; abs: 2.809e-03; rel: 3.491e-04; norm: 2.907e+00; mom: 1.211e-02;
## best it: 3; best obj: 7.320e+00
## It: 55; obj: 8.052e+00; abs: 2.636e-03; rel: 3.275e-04; norm: 2.909e+00; mom: 1.127e-02;
## best it: 3; best obj: 7.320e+00
## It: 56; obj: 8.054e+00; abs: 2.470e-03; rel: 3.067e-04; norm: 2.911e+00; mom: 1.048e-02;
## best it: 3; best obj: 7.320e+00
## It: 57; obj: 8.056e+00; abs: 2.309e-03; rel: 2.867e-04; norm: 2.913e+00; mom: 9.744e-03;
## best it: 3; best obj: 7.320e+00
## It: 58; obj: 8.058e+00; abs: 2.155e-03; rel: 2.674e-04; norm: 2.915e+00; mom: 9.055e-03;
## best it: 3; best obj: 7.320e+00
## It: 59; obj: 8.060e+00; abs: 2.007e-03; rel: 2.491e-04; norm: 2.916e+00; mom: 8.413e-03;
## best it: 3; best obj: 7.320e+00
## It: 60; obj: 8.062e+00; abs: 1.867e-03; rel: 2.316e-04; norm: 2.918e+00; mom: 7.817e-03;
## best it: 3; best obj: 7.320e+00
## It: 61; obj: 8.064e+00; abs: 1.734e-03; rel: 2.151e-04; norm: 2.919e+00; mom: 7.265e-03;

```

```

## best it: 3; best obj: 7.320e+00
## It: 62; obj: 8.066e+00; abs: 1.609e-03; rel: 1.995e-04; norm: 2.921e+00; mom: 6.754e-03;
## best it: 3; best obj: 7.320e+00
## It: 63; obj: 8.067e+00; abs: 1.490e-03; rel: 1.848e-04; norm: 2.922e+00; mom: 6.282e-03;
## best it: 3; best obj: 7.320e+00
## It: 64; obj: 8.069e+00; abs: 1.379e-03; rel: 1.710e-04; norm: 2.923e+00; mom: 5.849e-03;
## best it: 3; best obj: 7.320e+00
## It: 65; obj: 8.070e+00; abs: 1.275e-03; rel: 1.580e-04; norm: 2.924e+00; mom: 5.450e-03;
## best it: 3; best obj: 7.320e+00
## It: 66; obj: 8.071e+00; abs: 1.177e-03; rel: 1.459e-04; norm: 2.925e+00; mom: 5.085e-03;
## best it: 3; best obj: 7.320e+00
## It: 67; obj: 8.072e+00; abs: 1.086e-03; rel: 1.345e-04; norm: 2.926e+00; mom: 4.751e-03;
## best it: 3; best obj: 7.320e+00
## It: 68; obj: 8.073e+00; abs: 1.001e-03; rel: 1.240e-04; norm: 2.926e+00; mom: 4.447e-03;
## best it: 3; best obj: 7.320e+00
## It: 69; obj: 8.074e+00; abs: 9.217e-04; rel: 1.142e-04; norm: 2.927e+00; mom: 4.170e-03;
## best it: 3; best obj: 7.320e+00
## It: 70; obj: 8.075e+00; abs: 8.481e-04; rel: 1.050e-04; norm: 2.928e+00; mom: 3.919e-03;
## best it: 3; best obj: 7.320e+00
## It: 71; obj: 8.076e+00; abs: 7.798e-04; rel: 9.658e-05; norm: 2.929e+00; mom: 3.691e-03;
## best it: 3; best obj: 7.320e+00
## It: 72; obj: 8.076e+00; abs: 7.165e-04; rel: 8.873e-05; norm: 2.929e+00; mom: 3.486e-03;
## best it: 3; best obj: 7.320e+00
## It: 73; obj: 8.077e+00; abs: 6.579e-04; rel: 8.146e-05; norm: 2.930e+00; mom: 3.301e-03;
## best it: 3; best obj: 7.320e+00
## It: 74; obj: 8.078e+00; abs: 6.037e-04; rel: 7.474e-05; norm: 2.930e+00; mom: 3.135e-03;
## best it: 3; best obj: 7.320e+00
## It: 75; obj: 8.078e+00; abs: 5.536e-04; rel: 6.853e-05; norm: 2.931e+00; mom: 2.987e-03;
## best it: 3; best obj: 7.320e+00

## It: 76; obj: 8.079e+00; abs: 5.073e-04; rel: 6.280e-05; norm: 2.931e+00; mom: 2.855e-03;
## best it: 3; best obj: 7.320e+00
## It: 77; obj: 8.079e+00; abs: 4.646e-04; rel: 5.751e-05; norm: 2.931e+00; mom: 2.738e-03;
## best it: 3; best obj: 7.320e+00
## It: 78; obj: 8.080e+00; abs: 4.253e-04; rel: 5.264e-05; norm: 2.932e+00; mom: 2.634e-03;
## best it: 3; best obj: 7.320e+00
## It: 79; obj: 8.080e+00; abs: 3.890e-04; rel: 4.814e-05; norm: 2.932e+00; mom: 2.543e-03;
## best it: 3; best obj: 7.320e+00
## It: 80; obj: 8.080e+00; abs: 3.556e-04; rel: 4.401e-05; norm: 2.933e+00; mom: 2.463e-03;
## best it: 3; best obj: 7.320e+00
## It: 81; obj: 8.081e+00; abs: 3.249e-04; rel: 4.021e-05; norm: 2.933e+00; mom: 2.394e-03;
## best it: 3; best obj: 7.320e+00
## It: 82; obj: 8.081e+00; abs: 2.966e-04; rel: 3.671e-05; norm: 2.933e+00; mom: 2.334e-03;
## best it: 3; best obj: 7.320e+00
## It: 83; obj: 8.081e+00; abs: 2.706e-04; rel: 3.349e-05; norm: 2.933e+00; mom: 2.282e-03;
## best it: 3; best obj: 7.320e+00
## It: 84; obj: 8.081e+00; abs: 2.468e-04; rel: 3.054e-05; norm: 2.934e+00; mom: 2.237e-03;
## best it: 3; best obj: 7.320e+00
## It: 85; obj: 8.082e+00; abs: 2.248e-04; rel: 2.782e-05; norm: 2.934e+00; mom: 2.199e-03;
## best it: 3; best obj: 7.320e+00
## It: 86; obj: 8.082e+00; abs: 2.047e-04; rel: 2.533e-05; norm: 2.934e+00; mom: 2.167e-03;
## best it: 3; best obj: 7.320e+00
## It: 87; obj: 8.082e+00; abs: 1.862e-04; rel: 2.304e-05; norm: 2.934e+00; mom: 2.139e-03;
## best it: 3; best obj: 7.320e+00

```

```

## It: 88; obj: 8.082e+00; abs: 1.692e-04; rel: 2.094e-05; norm: 2.935e+00; mom: 2.116e-03;
## best it: 3; best obj: 7.320e+00
## It: 89; obj: 8.082e+00; abs: 1.537e-04; rel: 1.901e-05; norm: 2.935e+00; mom: 2.096e-03;
## best it: 3; best obj: 7.320e+00
## It: 90; obj: 8.083e+00; abs: 1.394e-04; rel: 1.725e-05; norm: 2.935e+00; mom: 2.080e-03;
## best it: 3; best obj: 7.320e+00
## It: 91; obj: 8.083e+00; abs: 1.263e-04; rel: 1.563e-05; norm: 2.935e+00; mom: 2.066e-03;
## best it: 3; best obj: 7.320e+00
## It: 92; obj: 8.083e+00; abs: 1.143e-04; rel: 1.414e-05; norm: 2.935e+00; mom: 2.055e-03;
## best it: 3; best obj: 7.320e+00
## It: 93; obj: 8.083e+00; abs: 1.033e-04; rel: 1.278e-05; norm: 2.935e+00; mom: 2.045e-03;
## best it: 3; best obj: 7.320e+00
## It: 94; obj: 8.083e+00; abs: 9.325e-05; rel: 1.154e-05; norm: 2.935e+00; mom: 2.037e-03;
## best it: 3; best obj: 7.320e+00
## It: 95; obj: 8.083e+00; abs: 8.402e-05; rel: 1.039e-05; norm: 2.936e+00; mom: 2.031e-03;
## best it: 3; best obj: 7.320e+00
## It: 96; obj: 8.083e+00; abs: 7.556e-05; rel: 9.348e-06; norm: 2.936e+00; mom: 2.025e-03;
## best it: 3; best obj: 7.320e+00
## It: 97; obj: 8.083e+00; abs: 6.781e-05; rel: 8.390e-06; norm: 2.936e+00; mom: 2.021e-03;
## best it: 3; best obj: 7.320e+00
## It: 98; obj: 8.083e+00; abs: 6.072e-05; rel: 7.512e-06; norm: 2.936e+00; mom: 2.017e-03;
## best it: 3; best obj: 7.320e+00
## It: 99; obj: 8.083e+00; abs: 5.423e-05; rel: 6.709e-06; norm: 2.936e+00; mom: 2.013e-03;
## best it: 3; best obj: 7.320e+00
## It: 100; obj: 8.083e+00; abs: 4.828e-05; rel: 5.973e-06; norm: 2.936e+00; mom: 2.011e-03;
## best it: 3; best obj: 7.320e+00

## It: 101; obj: 1.211e+00; abs: 6.873e+00; rel: 8.502e-01; norm: 1.152e-01; mom: 2.008e-03;
## best it: 101; best obj: 1.211e+00
## It: 102; obj: 1.399e+00; abs: 1.887e-01; rel: 1.559e-01; norm: 3.786e-01; mom: 5.442e+00;
## best it: 101; best obj: 1.211e+00
## It: 103; obj: 1.314e+00; abs: 8.485e-02; rel: 6.064e-02; norm: 3.968e-01; mom: 1.083e+01;
## best it: 101; best obj: 1.211e+00
## It: 104; obj: 1.276e+00; abs: 3.891e-02; rel: 2.960e-02; norm: 4.484e-01; mom: 1.105e+01;
## best it: 101; best obj: 1.211e+00
## It: 105; obj: 1.285e+00; abs: 9.096e-03; rel: 7.132e-03; norm: 4.287e-01; mom: 1.075e+01;
## best it: 101; best obj: 1.211e+00
## It: 106; obj: 1.394e+00; abs: 1.094e-01; rel: 8.518e-02; norm: 4.251e-01; mom: 1.054e+01;
## best it: 101; best obj: 1.211e+00
## It: 107; obj: 1.471e+00; abs: 7.745e-02; rel: 5.556e-02; norm: 4.635e-01; mom: 1.035e+01;
## best it: 101; best obj: 1.211e+00
## It: 108; obj: 1.652e+00; abs: 1.806e-01; rel: 1.227e-01; norm: 5.133e-01; mom: 1.016e+01;
## best it: 101; best obj: 1.211e+00
## It: 109; obj: 1.673e+00; abs: 2.114e-02; rel: 1.280e-02; norm: 5.922e-01; mom: 1.013e+01;
## best it: 101; best obj: 1.211e+00
## It: 110; obj: 1.692e+00; abs: 1.852e-02; rel: 1.107e-02; norm: 6.409e-01; mom: 1.013e+01;
## best it: 101; best obj: 1.211e+00
## It: 111; obj: 1.596e+00; abs: 9.579e-02; rel: 5.662e-02; norm: 6.692e-01; mom: 1.024e+01;
## best it: 101; best obj: 1.211e+00
## It: 112; obj: 1.594e+00; abs: 2.218e-03; rel: 1.389e-03; norm: 6.579e-01; mom: 1.022e+01;
## best it: 101; best obj: 1.211e+00
## It: 113; obj: 1.562e+00; abs: 3.145e-02; rel: 1.973e-02; norm: 6.504e-01; mom: 1.011e+01;
## best it: 101; best obj: 1.211e+00
## It: 114; obj: 1.555e+00; abs: 7.167e-03; rel: 4.588e-03; norm: 6.498e-01; mom: 1.007e+01;

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## best it: 101; best obj: 1.211e+00
## It: 115; obj: 1.550e+00; abs: 5.081e-03; rel: 3.267e-03; norm: 6.490e-01; mom: 1.013e+01;
## best it: 101; best obj: 1.211e+00
## It: 116; obj: 1.529e+00; abs: 2.062e-02; rel: 1.330e-02; norm: 6.468e-01; mom: 1.011e+01;
## best it: 101; best obj: 1.211e+00
## It: 117; obj: 1.543e+00; abs: 1.389e-02; rel: 9.083e-03; norm: 6.434e-01; mom: 1.004e+01;
## best it: 101; best obj: 1.211e+00
## It: 118; obj: 1.535e+00; abs: 8.173e-03; rel: 5.296e-03; norm: 6.406e-01; mom: 1.003e+01;
## best it: 101; best obj: 1.211e+00
## It: 119; obj: 1.552e+00; abs: 1.691e-02; rel: 1.102e-02; norm: 6.390e-01; mom: 1.004e+01;
## best it: 101; best obj: 1.211e+00
## It: 120; obj: 1.553e+00; abs: 1.320e-03; rel: 8.502e-04; norm: 6.363e-01; mom: 1.002e+01;
## best it: 101; best obj: 1.211e+00
## It: 121; obj: 1.525e+00; abs: 2.791e-02; rel: 1.797e-02; norm: 6.516e-01; mom: 1.010e+01;
## best it: 101; best obj: 1.211e+00
## It: 122; obj: 1.515e+00; abs: 1.028e-02; rel: 6.738e-03; norm: 6.360e-01; mom: 1.006e+01;
## best it: 101; best obj: 1.211e+00
## It: 123; obj: 1.543e+00; abs: 2.817e-02; rel: 1.859e-02; norm: 6.372e-01; mom: 1.005e+01;
## best it: 101; best obj: 1.211e+00
## It: 124; obj: 1.523e+00; abs: 2.041e-02; rel: 1.322e-02; norm: 6.269e-01; mom: 1.004e+01;
## best it: 101; best obj: 1.211e+00
## It: 125; obj: 1.537e+00; abs: 1.384e-02; rel: 9.084e-03; norm: 6.361e-01; mom: 1.008e+01;
## best it: 101; best obj: 1.211e+00

## It: 126; obj: 1.523e+00; abs: 1.403e-02; rel: 9.126e-03; norm: 6.313e-01; mom: 1.008e+01;
## best it: 101; best obj: 1.211e+00
## It: 127; obj: 1.529e+00; abs: 5.780e-03; rel: 3.796e-03; norm: 6.384e-01; mom: 1.005e+01;
## best it: 101; best obj: 1.211e+00
## It: 128; obj: 1.488e+00; abs: 4.062e-02; rel: 2.657e-02; norm: 6.285e-01; mom: 1.000e+01;
## best it: 101; best obj: 1.211e+00
## It: 129; obj: 1.517e+00; abs: 2.947e-02; rel: 1.981e-02; norm: 6.370e-01; mom: 9.961e+00;
## best it: 101; best obj: 1.211e+00
## It: 130; obj: 1.490e+00; abs: 2.777e-02; rel: 1.830e-02; norm: 6.195e-01; mom: 9.992e+00;
## best it: 101; best obj: 1.211e+00
## It: 131; obj: 1.521e+00; abs: 3.089e-02; rel: 2.074e-02; norm: 6.302e-01; mom: 9.989e+00;
## best it: 101; best obj: 1.211e+00
## It: 132; obj: 1.472e+00; abs: 4.829e-02; rel: 3.176e-02; norm: 6.240e-01; mom: 9.983e+00;
## best it: 101; best obj: 1.211e+00
## It: 133; obj: 1.517e+00; abs: 4.498e-02; rel: 3.056e-02; norm: 6.294e-01; mom: 9.979e+00;
## best it: 101; best obj: 1.211e+00
## It: 134; obj: 1.473e+00; abs: 4.412e-02; rel: 2.908e-02; norm: 6.140e-01; mom: 9.982e+00;
## best it: 101; best obj: 1.211e+00
## It: 135; obj: 1.516e+00; abs: 4.315e-02; rel: 2.929e-02; norm: 6.295e-01; mom: 9.955e+00;
## best it: 101; best obj: 1.211e+00
## It: 136; obj: 1.477e+00; abs: 3.950e-02; rel: 2.605e-02; norm: 6.129e-01; mom: 9.933e+00;
## best it: 101; best obj: 1.211e+00
## It: 137; obj: 1.510e+00; abs: 3.321e-02; rel: 2.249e-02; norm: 6.187e-01; mom: 1.001e+01;
## best it: 101; best obj: 1.211e+00
## It: 138; obj: 1.460e+00; abs: 4.961e-02; rel: 3.285e-02; norm: 6.081e-01; mom: 1.004e+01;
## best it: 101; best obj: 1.211e+00
## It: 139; obj: 1.515e+00; abs: 5.474e-02; rel: 3.749e-02; norm: 6.210e-01; mom: 9.946e+00;
## best it: 101; best obj: 1.211e+00
## It: 140; obj: 1.442e+00; abs: 7.304e-02; rel: 4.821e-02; norm: 6.073e-01; mom: 9.956e+00;
## best it: 101; best obj: 1.211e+00

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## It: 141; obj: 1.529e+00; abs: 8.731e-02; rel: 6.055e-02; norm: 6.071e-01; mom: 1.004e+01;
## best it: 101; best obj: 1.211e+00
## It: 142; obj: 1.506e+00; abs: 2.362e-02; rel: 1.544e-02; norm: 5.979e-01; mom: 1.001e+01;
## best it: 101; best obj: 1.211e+00
## It: 143; obj: 1.549e+00; abs: 4.341e-02; rel: 2.883e-02; norm: 6.292e-01; mom: 9.993e+00;
## best it: 101; best obj: 1.211e+00
## It: 144; obj: 1.493e+00; abs: 5.571e-02; rel: 3.596e-02; norm: 6.205e-01; mom: 1.003e+01;
## best it: 101; best obj: 1.211e+00
## It: 145; obj: 1.527e+00; abs: 3.388e-02; rel: 2.269e-02; norm: 6.339e-01; mom: 1.002e+01;
## best it: 101; best obj: 1.211e+00
## It: 146; obj: 1.539e+00; abs: 1.154e-02; rel: 7.559e-03; norm: 6.067e-01; mom: 9.937e+00;
## best it: 101; best obj: 1.211e+00
## It: 147; obj: 1.563e+00; abs: 2.459e-02; rel: 1.598e-02; norm: 6.269e-01; mom: 1.002e+01;
## best it: 101; best obj: 1.211e+00
## It: 148; obj: 1.518e+00; abs: 4.545e-02; rel: 2.907e-02; norm: 6.229e-01; mom: 1.007e+01;
## best it: 101; best obj: 1.211e+00
## It: 149; obj: 1.559e+00; abs: 4.134e-02; rel: 2.723e-02; norm: 6.405e-01; mom: 9.983e+00;
## best it: 101; best obj: 1.211e+00
## It: 150; obj: 1.494e+00; abs: 6.548e-02; rel: 4.199e-02; norm: 6.215e-01; mom: 9.908e+00;
## best it: 101; best obj: 1.211e+00

## It: 151; obj: 1.540e+00; abs: 4.662e-02; rel: 3.121e-02; norm: 6.188e-01; mom: 1.007e+01;
## best it: 101; best obj: 1.211e+00
## It: 152; obj: 1.524e+00; abs: 1.659e-02; rel: 1.077e-02; norm: 6.018e-01; mom: 1.000e+01;
## best it: 101; best obj: 1.211e+00
## It: 153; obj: 1.561e+00; abs: 3.679e-02; rel: 2.414e-02; norm: 6.201e-01; mom: 1.004e+01;
## best it: 101; best obj: 1.211e+00
## It: 154; obj: 1.520e+00; abs: 4.036e-02; rel: 2.586e-02; norm: 6.236e-01; mom: 1.001e+01;
## best it: 101; best obj: 1.211e+00
## It: 155; obj: 1.530e+00; abs: 9.985e-03; rel: 6.568e-03; norm: 6.362e-01; mom: 1.000e+01;
## best it: 101; best obj: 1.211e+00
## It: 156; obj: 1.505e+00; abs: 2.538e-02; rel: 1.658e-02; norm: 6.110e-01; mom: 9.980e+00;
## best it: 101; best obj: 1.211e+00
## It: 157; obj: 1.528e+00; abs: 2.279e-02; rel: 1.514e-02; norm: 6.151e-01; mom: 1.002e+01;
## best it: 101; best obj: 1.211e+00
## It: 158; obj: 1.523e+00; abs: 4.881e-03; rel: 3.195e-03; norm: 6.098e-01; mom: 9.946e+00;
## best it: 101; best obj: 1.211e+00
## It: 159; obj: 1.526e+00; abs: 3.123e-03; rel: 2.051e-03; norm: 6.211e-01; mom: 1.006e+01;
## best it: 101; best obj: 1.211e+00
## It: 160; obj: 1.524e+00; abs: 1.603e-03; rel: 1.050e-03; norm: 6.075e-01; mom: 1.005e+01;
## best it: 101; best obj: 1.211e+00
## It: 161; obj: 1.520e+00; abs: 3.955e-03; rel: 2.595e-03; norm: 6.132e-01; mom: 1.002e+01;
## best it: 101; best obj: 1.211e+00
## It: 162; obj: 1.490e+00; abs: 3.042e-02; rel: 2.001e-02; norm: 6.071e-01; mom: 1.001e+01;
## best it: 101; best obj: 1.211e+00
## It: 163; obj: 1.511e+00; abs: 2.053e-02; rel: 1.378e-02; norm: 6.032e-01; mom: 1.003e+01;
## best it: 101; best obj: 1.211e+00
## It: 164; obj: 1.519e+00; abs: 7.990e-03; rel: 5.290e-03; norm: 5.919e-01; mom: 1.001e+01;
## best it: 101; best obj: 1.211e+00
## It: 165; obj: 1.526e+00; abs: 7.689e-03; rel: 5.064e-03; norm: 6.077e-01; mom: 1.004e+01;
## best it: 101; best obj: 1.211e+00
## It: 166; obj: 1.513e+00; abs: 1.307e-02; rel: 8.561e-03; norm: 6.048e-01; mom: 1.010e+01;
## best it: 101; best obj: 1.211e+00
## It: 167; obj: 1.526e+00; abs: 1.267e-02; rel: 8.372e-03; norm: 6.115e-01; mom: 1.005e+01;

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## best it: 101; best obj: 1.211e+00
## It: 168; obj: 1.515e+00; abs: 1.064e-02; rel: 6.973e-03; norm: 5.990e-01; mom: 1.001e+01;
## best it: 101; best obj: 1.211e+00
## It: 169; obj: 1.504e+00; abs: 1.154e-02; rel: 7.615e-03; norm: 6.097e-01; mom: 1.005e+01;
## best it: 101; best obj: 1.211e+00
## It: 170; obj: 1.512e+00; abs: 8.875e-03; rel: 5.902e-03; norm: 6.009e-01; mom: 1.002e+01;
## best it: 101; best obj: 1.211e+00
## It: 171; obj: 1.538e+00; abs: 2.532e-02; rel: 1.674e-02; norm: 6.041e-01; mom: 1.003e+01;
## best it: 101; best obj: 1.211e+00
## It: 172; obj: 1.519e+00; abs: 1.847e-02; rel: 1.201e-02; norm: 6.010e-01; mom: 1.007e+01;
## best it: 101; best obj: 1.211e+00
## It: 173; obj: 1.548e+00; abs: 2.891e-02; rel: 1.903e-02; norm: 6.087e-01; mom: 1.006e+01;
## best it: 101; best obj: 1.211e+00
## It: 174; obj: 1.502e+00; abs: 4.660e-02; rel: 3.010e-02; norm: 6.026e-01; mom: 9.986e+00;
## best it: 101; best obj: 1.211e+00
## It: 175; obj: 1.515e+00; abs: 1.382e-02; rel: 9.200e-03; norm: 6.033e-01; mom: 1.005e+01;
## best it: 101; best obj: 1.211e+00

## It: 176; obj: 1.535e+00; abs: 1.957e-02; rel: 1.292e-02; norm: 5.901e-01; mom: 1.006e+01;
## best it: 101; best obj: 1.211e+00
## It: 177; obj: 1.554e+00; abs: 1.846e-02; rel: 1.203e-02; norm: 6.111e-01; mom: 1.005e+01;
## best it: 101; best obj: 1.211e+00
## It: 178; obj: 1.535e+00; abs: 1.858e-02; rel: 1.196e-02; norm: 6.107e-01; mom: 1.008e+01;
## best it: 101; best obj: 1.211e+00
## It: 179; obj: 1.545e+00; abs: 1.005e-02; rel: 6.546e-03; norm: 6.242e-01; mom: 1.007e+01;
## best it: 101; best obj: 1.211e+00
## It: 180; obj: 1.559e+00; abs: 1.373e-02; rel: 8.888e-03; norm: 6.122e-01; mom: 1.004e+01;
## best it: 101; best obj: 1.211e+00
## It: 181; obj: 1.564e+00; abs: 5.646e-03; rel: 3.622e-03; norm: 6.245e-01; mom: 1.006e+01;
## best it: 101; best obj: 1.211e+00
## It: 182; obj: 1.550e+00; abs: 1.411e-02; rel: 9.017e-03; norm: 6.233e-01; mom: 1.011e+01;
## best it: 101; best obj: 1.211e+00
## It: 183; obj: 1.556e+00; abs: 6.068e-03; rel: 3.914e-03; norm: 6.237e-01; mom: 1.015e+01;
## best it: 101; best obj: 1.211e+00
## It: 184; obj: 1.553e+00; abs: 2.978e-03; rel: 1.913e-03; norm: 6.159e-01; mom: 1.013e+01;
## best it: 101; best obj: 1.211e+00
## It: 185; obj: 1.561e+00; abs: 7.893e-03; rel: 5.081e-03; norm: 6.234e-01; mom: 1.012e+01;
## best it: 101; best obj: 1.211e+00
## It: 186; obj: 1.564e+00; abs: 2.755e-03; rel: 1.765e-03; norm: 6.175e-01; mom: 1.008e+01;
## best it: 101; best obj: 1.211e+00
## It: 187; obj: 1.552e+00; abs: 1.227e-02; rel: 7.846e-03; norm: 6.194e-01; mom: 1.015e+01;
## best it: 101; best obj: 1.211e+00
## It: 188; obj: 1.554e+00; abs: 2.358e-03; rel: 1.520e-03; norm: 6.164e-01; mom: 1.017e+01;
## best it: 101; best obj: 1.211e+00
## It: 189; obj: 1.604e+00; abs: 5.007e-02; rel: 3.222e-02; norm: 6.111e-01; mom: 1.007e+01;
## best it: 101; best obj: 1.211e+00
## It: 190; obj: 1.572e+00; abs: 3.205e-02; rel: 1.998e-02; norm: 6.232e-01; mom: 1.012e+01;
## best it: 101; best obj: 1.211e+00
## It: 191; obj: 1.535e+00; abs: 3.678e-02; rel: 2.340e-02; norm: 6.406e-01; mom: 1.022e+01;
## best it: 101; best obj: 1.211e+00
## It: 192; obj: 1.562e+00; abs: 2.659e-02; rel: 1.732e-02; norm: 6.137e-01; mom: 1.010e+01;
## best it: 101; best obj: 1.211e+00
## It: 193; obj: 1.561e+00; abs: 1.006e-03; rel: 6.441e-04; norm: 6.154e-01; mom: 1.010e+01;
## best it: 101; best obj: 1.211e+00

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## It: 194; obj: 1.557e+00; abs: 3.489e-03; rel: 2.235e-03; norm: 6.219e-01; mom: 1.015e+01;
## best it: 101; best obj: 1.211e+00
## It: 195; obj: 1.554e+00; abs: 3.512e-03; rel: 2.255e-03; norm: 6.180e-01; mom: 1.016e+01;
## best it: 101; best obj: 1.211e+00
## It: 196; obj: 1.570e+00; abs: 1.618e-02; rel: 1.041e-02; norm: 6.103e-01; mom: 1.014e+01;
## best it: 101; best obj: 1.211e+00
## It: 197; obj: 1.592e+00; abs: 2.172e-02; rel: 1.383e-02; norm: 6.182e-01; mom: 1.015e+01;
## best it: 101; best obj: 1.211e+00
## It: 198; obj: 1.569e+00; abs: 2.238e-02; rel: 1.406e-02; norm: 6.208e-01; mom: 1.015e+01;
## best it: 101; best obj: 1.211e+00
## It: 199; obj: 1.543e+00; abs: 2.622e-02; rel: 1.670e-02; norm: 6.286e-01; mom: 1.016e+01;
## best it: 101; best obj: 1.211e+00
## It: 200; obj: 1.546e+00; abs: 2.716e-03; rel: 1.760e-03; norm: 6.163e-01; mom: 1.012e+01;
## best it: 101; best obj: 1.211e+00

## It: 201; obj: 1.549e+00; abs: 3.143e-03; rel: 2.033e-03; norm: 6.191e-01; mom: 1.010e+01;
## best it: 101; best obj: 1.211e+00
## It: 202; obj: 1.548e+00; abs: 9.296e-04; rel: 6.001e-04; norm: 6.062e-01; mom: 1.012e+01;
## best it: 101; best obj: 1.211e+00
## It: 203; obj: 1.562e+00; abs: 1.400e-02; rel: 9.041e-03; norm: 6.161e-01; mom: 1.011e+01;
## best it: 101; best obj: 1.211e+00
## It: 204; obj: 1.550e+00; abs: 1.257e-02; rel: 8.046e-03; norm: 6.113e-01; mom: 1.012e+01;
## best it: 101; best obj: 1.211e+00
## It: 205; obj: 1.568e+00; abs: 1.883e-02; rel: 1.215e-02; norm: 6.208e-01; mom: 1.014e+01;
## best it: 101; best obj: 1.211e+00
## It: 206; obj: 1.549e+00; abs: 1.921e-02; rel: 1.225e-02; norm: 6.161e-01; mom: 1.011e+01;
## best it: 101; best obj: 1.211e+00
## It: 207; obj: 1.562e+00; abs: 1.239e-02; rel: 7.995e-03; norm: 6.160e-01; mom: 1.012e+01;
## best it: 101; best obj: 1.211e+00
## It: 208; obj: 1.544e+00; abs: 1.721e-02; rel: 1.102e-02; norm: 6.165e-01; mom: 1.013e+01;
## best it: 101; best obj: 1.211e+00
## It: 209; obj: 1.564e+00; abs: 2.008e-02; rel: 1.300e-02; norm: 6.171e-01; mom: 1.015e+01;
## best it: 101; best obj: 1.211e+00
## It: 210; obj: 1.541e+00; abs: 2.341e-02; rel: 1.496e-02; norm: 6.104e-01; mom: 1.016e+01;
## best it: 101; best obj: 1.211e+00
## It: 211; obj: 1.597e+00; abs: 5.551e-02; rel: 3.602e-02; norm: 6.146e-01; mom: 1.011e+01;
## best it: 101; best obj: 1.211e+00
## It: 212; obj: 1.540e+00; abs: 5.693e-02; rel: 3.566e-02; norm: 6.186e-01; mom: 1.012e+01;
## best it: 101; best obj: 1.211e+00
## It: 213; obj: 1.581e+00; abs: 4.129e-02; rel: 2.682e-02; norm: 6.229e-01; mom: 1.015e+01;
## best it: 101; best obj: 1.211e+00
## It: 214; obj: 1.546e+00; abs: 3.496e-02; rel: 2.211e-02; norm: 6.156e-01; mom: 1.013e+01;
## best it: 101; best obj: 1.211e+00
## It: 215; obj: 1.585e+00; abs: 3.912e-02; rel: 2.530e-02; norm: 6.168e-01; mom: 1.013e+01;
## best it: 101; best obj: 1.211e+00
## It: 216; obj: 1.539e+00; abs: 4.565e-02; rel: 2.880e-02; norm: 6.183e-01; mom: 1.017e+01;
## best it: 101; best obj: 1.211e+00
## It: 217; obj: 1.578e+00; abs: 3.847e-02; rel: 2.499e-02; norm: 6.206e-01; mom: 1.016e+01;
## best it: 101; best obj: 1.211e+00
## It: 218; obj: 1.527e+00; abs: 5.053e-02; rel: 3.203e-02; norm: 6.174e-01; mom: 1.012e+01;
## best it: 101; best obj: 1.211e+00
## It: 219; obj: 1.572e+00; abs: 4.459e-02; rel: 2.919e-02; norm: 6.202e-01; mom: 1.013e+01;
## best it: 101; best obj: 1.211e+00
## It: 220; obj: 1.583e+00; abs: 1.061e-02; rel: 6.751e-03; norm: 6.096e-01; mom: 1.008e+01;

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## best it: 101; best obj: 1.211e+00
## It: 221; obj: 1.592e+00; abs: 9.545e-03; rel: 6.031e-03; norm: 6.175e-01; mom: 1.015e+01;
## best it: 101; best obj: 1.211e+00
## It: 222; obj: 1.559e+00; abs: 3.343e-02; rel: 2.100e-02; norm: 6.296e-01; mom: 1.019e+01;
## best it: 101; best obj: 1.211e+00
## It: 223; obj: 1.578e+00; abs: 1.948e-02; rel: 1.250e-02; norm: 6.279e-01; mom: 1.014e+01;
## best it: 101; best obj: 1.211e+00
## It: 224; obj: 1.563e+00; abs: 1.560e-02; rel: 9.882e-03; norm: 6.117e-01; mom: 1.017e+01;
## best it: 101; best obj: 1.211e+00
## It: 225; obj: 1.578e+00; abs: 1.545e-02; rel: 9.891e-03; norm: 6.167e-01; mom: 1.016e+01;
## best it: 101; best obj: 1.211e+00

## It: 226; obj: 1.554e+00; abs: 2.411e-02; rel: 1.528e-02; norm: 6.282e-01; mom: 1.008e+01;
## best it: 101; best obj: 1.211e+00
## It: 227; obj: 1.570e+00; abs: 1.573e-02; rel: 1.012e-02; norm: 6.216e-01; mom: 1.013e+01;
## best it: 101; best obj: 1.211e+00
## It: 228; obj: 1.573e+00; abs: 3.264e-03; rel: 2.080e-03; norm: 6.045e-01; mom: 1.016e+01;
## best it: 101; best obj: 1.211e+00
## It: 229; obj: 1.598e+00; abs: 2.513e-02; rel: 1.598e-02; norm: 6.215e-01; mom: 1.012e+01;
## best it: 101; best obj: 1.211e+00
## It: 230; obj: 1.549e+00; abs: 4.920e-02; rel: 3.079e-02; norm: 6.253e-01; mom: 1.018e+01;
## best it: 101; best obj: 1.211e+00
## It: 231; obj: 1.574e+00; abs: 2.505e-02; rel: 1.618e-02; norm: 6.257e-01; mom: 1.018e+01;
## best it: 101; best obj: 1.211e+00
## It: 232; obj: 1.562e+00; abs: 1.211e-02; rel: 7.693e-03; norm: 6.164e-01; mom: 1.013e+01;
## best it: 101; best obj: 1.211e+00
## It: 233; obj: 1.582e+00; abs: 2.047e-02; rel: 1.311e-02; norm: 6.162e-01; mom: 1.018e+01;
## best it: 101; best obj: 1.211e+00
## It: 234; obj: 1.571e+00; abs: 1.129e-02; rel: 7.135e-03; norm: 6.196e-01; mom: 1.017e+01;
## best it: 101; best obj: 1.211e+00
## It: 235; obj: 1.581e+00; abs: 9.710e-03; rel: 6.181e-03; norm: 6.202e-01; mom: 1.016e+01;
## best it: 101; best obj: 1.211e+00
## It: 236; obj: 1.585e+00; abs: 4.446e-03; rel: 2.813e-03; norm: 6.105e-01; mom: 1.016e+01;
## best it: 101; best obj: 1.211e+00
## It: 237; obj: 1.571e+00; abs: 1.380e-02; rel: 8.703e-03; norm: 6.174e-01; mom: 1.015e+01;
## best it: 101; best obj: 1.211e+00
## It: 238; obj: 1.548e+00; abs: 2.324e-02; rel: 1.479e-02; norm: 6.190e-01; mom: 1.014e+01;
## best it: 101; best obj: 1.211e+00
## It: 239; obj: 1.606e+00; abs: 5.748e-02; rel: 3.713e-02; norm: 6.061e-01; mom: 1.016e+01;
## best it: 101; best obj: 1.211e+00
## It: 240; obj: 1.578e+00; abs: 2.742e-02; rel: 1.708e-02; norm: 6.067e-01; mom: 1.022e+01;
## best it: 101; best obj: 1.211e+00
## It: 241; obj: 1.572e+00; abs: 6.002e-03; rel: 3.803e-03; norm: 6.271e-01; mom: 1.029e+01;
## best it: 101; best obj: 1.211e+00
## It: 242; obj: 1.571e+00; abs: 1.297e-03; rel: 8.251e-04; norm: 6.130e-01; mom: 1.023e+01;
## best it: 101; best obj: 1.211e+00
## It: 243; obj: 1.592e+00; abs: 2.124e-02; rel: 1.352e-02; norm: 6.162e-01; mom: 1.018e+01;
## best it: 101; best obj: 1.211e+00
## It: 244; obj: 1.552e+00; abs: 3.994e-02; rel: 2.508e-02; norm: 6.210e-01; mom: 1.018e+01;
## best it: 101; best obj: 1.211e+00
## It: 245; obj: 1.558e+00; abs: 5.904e-03; rel: 3.804e-03; norm: 6.250e-01; mom: 1.022e+01;
## best it: 101; best obj: 1.211e+00
## It: 246; obj: 1.572e+00; abs: 1.407e-02; rel: 9.030e-03; norm: 6.034e-01; mom: 1.014e+01;
## best it: 101; best obj: 1.211e+00

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## It: 247; obj: 1.583e+00; abs: 1.090e-02; rel: 6.933e-03; norm: 6.162e-01; mom: 1.015e+01;
## best it: 101; best obj: 1.211e+00
## It: 248; obj: 1.521e+00; abs: 6.243e-02; rel: 3.944e-02; norm: 6.168e-01; mom: 1.637e+01;
## best it: 101; best obj: 1.211e+00
## It: 249; obj: 1.572e+00; abs: 5.163e-02; rel: 3.395e-02; norm: 6.041e-01; mom: 1.616e+01;
## best it: 101; best obj: 1.211e+00
## It: 250; obj: 1.528e+00; abs: 4.390e-02; rel: 2.792e-02; norm: 5.965e-01; mom: 1.608e+01;
## best it: 101; best obj: 1.211e+00

## It: 251; obj: 1.587e+00; abs: 5.875e-02; rel: 3.844e-02; norm: 6.048e-01; mom: 1.614e+01;
## best it: 101; best obj: 1.211e+00
## It: 252; obj: 1.517e+00; abs: 7.033e-02; rel: 4.431e-02; norm: 5.993e-01; mom: 1.616e+01;
## best it: 101; best obj: 1.211e+00
## It: 253; obj: 1.561e+00; abs: 4.418e-02; rel: 2.913e-02; norm: 6.136e-01; mom: 1.617e+01;
## best it: 101; best obj: 1.211e+00
## It: 254; obj: 1.515e+00; abs: 4.570e-02; rel: 2.928e-02; norm: 5.931e-01; mom: 1.608e+01;
## best it: 101; best obj: 1.211e+00
## It: 255; obj: 1.565e+00; abs: 4.993e-02; rel: 3.295e-02; norm: 5.995e-01; mom: 1.614e+01;
## best it: 101; best obj: 1.211e+00
## It: 256; obj: 1.519e+00; abs: 4.661e-02; rel: 2.978e-02; norm: 6.043e-01; mom: 1.604e+01;
## best it: 101; best obj: 1.211e+00
## It: 257; obj: 1.565e+00; abs: 4.677e-02; rel: 3.080e-02; norm: 6.026e-01; mom: 1.615e+01;
## best it: 101; best obj: 1.211e+00
## It: 258; obj: 1.533e+00; abs: 3.213e-02; rel: 2.053e-02; norm: 5.957e-01; mom: 1.611e+01;
## best it: 101; best obj: 1.211e+00
## It: 259; obj: 1.579e+00; abs: 4.573e-02; rel: 2.983e-02; norm: 6.095e-01; mom: 1.606e+01;
## best it: 101; best obj: 1.211e+00
## It: 260; obj: 1.527e+00; abs: 5.202e-02; rel: 3.295e-02; norm: 6.024e-01; mom: 1.614e+01;
## best it: 101; best obj: 1.211e+00
## It: 261; obj: 1.561e+00; abs: 3.418e-02; rel: 2.238e-02; norm: 6.111e-01; mom: 1.614e+01;
## best it: 101; best obj: 1.211e+00
## It: 262; obj: 1.527e+00; abs: 3.385e-02; rel: 2.169e-02; norm: 6.002e-01; mom: 1.604e+01;
## best it: 101; best obj: 1.211e+00
## It: 263; obj: 1.614e+00; abs: 8.672e-02; rel: 5.679e-02; norm: 6.003e-01; mom: 1.612e+01;
## best it: 101; best obj: 1.211e+00
## It: 264; obj: 1.536e+00; abs: 7.841e-02; rel: 4.858e-02; norm: 6.113e-01; mom: 1.620e+01;
## best it: 101; best obj: 1.211e+00
## It: 265; obj: 1.573e+00; abs: 3.720e-02; rel: 2.423e-02; norm: 6.345e-01; mom: 1.615e+01;
## best it: 101; best obj: 1.211e+00
## It: 266; obj: 1.536e+00; abs: 3.638e-02; rel: 2.313e-02; norm: 6.033e-01; mom: 1.609e+01;
## best it: 101; best obj: 1.211e+00
## It: 267; obj: 1.554e+00; abs: 1.807e-02; rel: 1.176e-02; norm: 6.063e-01; mom: 1.618e+01;
## best it: 101; best obj: 1.211e+00
## It: 268; obj: 1.514e+00; abs: 4.067e-02; rel: 2.616e-02; norm: 6.035e-01; mom: 1.611e+01;
## best it: 101; best obj: 1.211e+00
## It: 269; obj: 1.571e+00; abs: 5.756e-02; rel: 3.802e-02; norm: 6.082e-01; mom: 1.609e+01;
## best it: 101; best obj: 1.211e+00
## It: 270; obj: 1.513e+00; abs: 5.796e-02; rel: 3.688e-02; norm: 5.962e-01; mom: 1.613e+01;
## best it: 101; best obj: 1.211e+00
## It: 271; obj: 1.568e+00; abs: 5.456e-02; rel: 3.606e-02; norm: 6.080e-01; mom: 1.618e+01;
## best it: 101; best obj: 1.211e+00
## It: 272; obj: 1.514e+00; abs: 5.422e-02; rel: 3.458e-02; norm: 5.902e-01; mom: 1.614e+01;
## best it: 101; best obj: 1.211e+00
## It: 273; obj: 1.552e+00; abs: 3.785e-02; rel: 2.501e-02; norm: 6.057e-01; mom: 1.616e+01;

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## best it: 101; best obj: 1.211e+00
## It: 274; obj: 1.499e+00; abs: 5.222e-02; rel: 3.366e-02; norm: 6.024e-01; mom: 1.613e+01;
## best it: 101; best obj: 1.211e+00
## It: 275; obj: 1.590e+00; abs: 9.092e-02; rel: 6.064e-02; norm: 5.965e-01; mom: 1.616e+01;
## best it: 101; best obj: 1.211e+00
## It: 276; obj: 1.491e+00; abs: 9.899e-02; rel: 6.225e-02; norm: 5.955e-01; mom: 1.626e+01;
## best it: 101; best obj: 1.211e+00
## It: 277; obj: 1.571e+00; abs: 8.007e-02; rel: 5.369e-02; norm: 6.085e-01; mom: 1.616e+01;
## best it: 101; best obj: 1.211e+00
## It: 278; obj: 1.498e+00; abs: 7.350e-02; rel: 4.678e-02; norm: 5.928e-01; mom: 1.615e+01;
## best it: 101; best obj: 1.211e+00
## It: 279; obj: 1.562e+00; abs: 6.445e-02; rel: 4.303e-02; norm: 6.014e-01; mom: 1.618e+01;
## best it: 101; best obj: 1.211e+00
## It: 280; obj: 1.512e+00; abs: 5.001e-02; rel: 3.201e-02; norm: 5.951e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 281; obj: 1.594e+00; abs: 8.128e-02; rel: 5.375e-02; norm: 6.023e-01; mom: 1.618e+01;
## best it: 101; best obj: 1.211e+00
## It: 282; obj: 1.491e+00; abs: 1.022e-01; rel: 6.413e-02; norm: 6.022e-01; mom: 1.626e+01;
## best it: 101; best obj: 1.211e+00
## It: 283; obj: 1.569e+00; abs: 7.751e-02; rel: 5.197e-02; norm: 6.139e-01; mom: 1.617e+01;
## best it: 101; best obj: 1.211e+00
## It: 284; obj: 1.519e+00; abs: 4.962e-02; rel: 3.163e-02; norm: 5.934e-01; mom: 1.617e+01;
## best it: 101; best obj: 1.211e+00
## It: 285; obj: 1.567e+00; abs: 4.749e-02; rel: 3.126e-02; norm: 6.006e-01; mom: 1.629e+01;
## best it: 101; best obj: 1.211e+00
## It: 286; obj: 1.484e+00; abs: 8.298e-02; rel: 5.297e-02; norm: 6.056e-01; mom: 1.621e+01;
## best it: 101; best obj: 1.211e+00
## It: 287; obj: 1.576e+00; abs: 9.240e-02; rel: 6.227e-02; norm: 6.007e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 288; obj: 1.513e+00; abs: 6.322e-02; rel: 4.011e-02; norm: 5.900e-01; mom: 1.617e+01;
## best it: 101; best obj: 1.211e+00
## It: 289; obj: 1.568e+00; abs: 5.485e-02; rel: 3.626e-02; norm: 6.039e-01; mom: 1.623e+01;
## best it: 101; best obj: 1.211e+00
## It: 290; obj: 1.490e+00; abs: 7.757e-02; rel: 4.948e-02; norm: 5.969e-01; mom: 1.620e+01;
## best it: 101; best obj: 1.211e+00
## It: 291; obj: 1.551e+00; abs: 6.070e-02; rel: 4.074e-02; norm: 6.025e-01; mom: 1.612e+01;
## best it: 101; best obj: 1.211e+00
## It: 292; obj: 1.522e+00; abs: 2.907e-02; rel: 1.875e-02; norm: 5.950e-01; mom: 1.608e+01;
## best it: 101; best obj: 1.211e+00
## It: 293; obj: 1.549e+00; abs: 2.677e-02; rel: 1.759e-02; norm: 5.980e-01; mom: 1.622e+01;
## best it: 101; best obj: 1.211e+00
## It: 294; obj: 1.522e+00; abs: 2.630e-02; rel: 1.698e-02; norm: 6.007e-01; mom: 1.619e+01;
## best it: 101; best obj: 1.211e+00
## It: 295; obj: 1.524e+00; abs: 1.736e-03; rel: 1.140e-03; norm: 6.062e-01; mom: 1.613e+01;
## best it: 101; best obj: 1.211e+00
## It: 296; obj: 1.502e+00; abs: 2.196e-02; rel: 1.441e-02; norm: 5.956e-01; mom: 1.616e+01;
## best it: 101; best obj: 1.211e+00
## It: 297; obj: 1.547e+00; abs: 4.506e-02; rel: 3.000e-02; norm: 5.955e-01; mom: 1.607e+01;
## best it: 101; best obj: 1.211e+00
## It: 298; obj: 1.519e+00; abs: 2.794e-02; rel: 1.806e-02; norm: 5.973e-01; mom: 1.609e+01;
## best it: 101; best obj: 1.211e+00
## It: 299; obj: 1.532e+00; abs: 1.247e-02; rel: 8.208e-03; norm: 6.022e-01; mom: 1.616e+01;
## best it: 101; best obj: 1.211e+00

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## It: 300; obj: 1.522e+00; abs: 9.359e-03; rel: 6.110e-03; norm: 5.984e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00

## It: 301; obj: 1.530e+00; abs: 7.997e-03; rel: 5.254e-03; norm: 6.045e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00

## It: 302; obj: 1.520e+00; abs: 1.046e-02; rel: 6.834e-03; norm: 5.960e-01; mom: 1.612e+01;
## best it: 101; best obj: 1.211e+00

## It: 303; obj: 1.550e+00; abs: 3.013e-02; rel: 1.983e-02; norm: 5.983e-01; mom: 1.613e+01;
## best it: 101; best obj: 1.211e+00

## It: 304; obj: 1.512e+00; abs: 3.815e-02; rel: 2.461e-02; norm: 6.040e-01; mom: 1.618e+01;
## best it: 101; best obj: 1.211e+00

## It: 305; obj: 1.537e+00; abs: 2.509e-02; rel: 1.659e-02; norm: 5.994e-01; mom: 1.611e+01;
## best it: 101; best obj: 1.211e+00

## It: 306; obj: 1.511e+00; abs: 2.544e-02; rel: 1.656e-02; norm: 6.022e-01; mom: 1.611e+01;
## best it: 101; best obj: 1.211e+00

## It: 307; obj: 1.526e+00; abs: 1.484e-02; rel: 9.816e-03; norm: 6.037e-01; mom: 1.616e+01;
## best it: 101; best obj: 1.211e+00

## It: 308; obj: 1.529e+00; abs: 3.045e-03; rel: 1.995e-03; norm: 5.936e-01; mom: 1.606e+01;
## best it: 101; best obj: 1.211e+00

## It: 309; obj: 1.512e+00; abs: 1.763e-02; rel: 1.153e-02; norm: 6.028e-01; mom: 1.615e+01;
## best it: 101; best obj: 1.211e+00

## It: 310; obj: 1.515e+00; abs: 2.922e-03; rel: 1.933e-03; norm: 5.998e-01; mom: 1.612e+01;
## best it: 101; best obj: 1.211e+00

## It: 311; obj: 1.540e+00; abs: 2.570e-02; rel: 1.697e-02; norm: 5.926e-01; mom: 1.605e+01;
## best it: 101; best obj: 1.211e+00

## It: 312; obj: 1.534e+00; abs: 6.130e-03; rel: 3.980e-03; norm: 6.038e-01; mom: 1.614e+01;
## best it: 101; best obj: 1.211e+00

## It: 313; obj: 1.507e+00; abs: 2.688e-02; rel: 1.752e-02; norm: 6.128e-01; mom: 1.623e+01;
## best it: 101; best obj: 1.211e+00

## It: 314; obj: 1.537e+00; abs: 2.933e-02; rel: 1.946e-02; norm: 5.949e-01; mom: 1.613e+01;
## best it: 101; best obj: 1.211e+00

## It: 315; obj: 1.538e+00; abs: 9.680e-04; rel: 6.299e-04; norm: 5.987e-01; mom: 1.613e+01;
## best it: 101; best obj: 1.211e+00

## It: 316; obj: 1.519e+00; abs: 1.815e-02; rel: 1.180e-02; norm: 6.052e-01; mom: 1.619e+01;
## best it: 101; best obj: 1.211e+00

## It: 317; obj: 1.539e+00; abs: 1.911e-02; rel: 1.258e-02; norm: 5.994e-01; mom: 1.611e+01;
## best it: 101; best obj: 1.211e+00

## It: 318; obj: 1.542e+00; abs: 3.054e-03; rel: 1.985e-03; norm: 6.003e-01; mom: 1.613e+01;
## best it: 101; best obj: 1.211e+00

## It: 319; obj: 1.518e+00; abs: 2.371e-02; rel: 1.538e-02; norm: 6.083e-01; mom: 1.623e+01;
## best it: 101; best obj: 1.211e+00

## It: 320; obj: 1.537e+00; abs: 1.861e-02; rel: 1.226e-02; norm: 5.995e-01; mom: 1.615e+01;
## best it: 101; best obj: 1.211e+00

## It: 321; obj: 1.495e+00; abs: 4.195e-02; rel: 2.730e-02; norm: 6.036e-01; mom: 1.617e+01;
## best it: 101; best obj: 1.211e+00

## It: 322; obj: 1.533e+00; abs: 3.873e-02; rel: 2.591e-02; norm: 5.985e-01; mom: 1.608e+01;
## best it: 101; best obj: 1.211e+00

## It: 323; obj: 1.512e+00; abs: 2.174e-02; rel: 1.418e-02; norm: 5.930e-01; mom: 1.608e+01;
## best it: 101; best obj: 1.211e+00

## It: 324; obj: 1.520e+00; abs: 8.034e-03; rel: 5.315e-03; norm: 6.042e-01; mom: 1.624e+01;
## best it: 101; best obj: 1.211e+00

## It: 325; obj: 1.531e+00; abs: 1.184e-02; rel: 7.791e-03; norm: 6.007e-01; mom: 1.609e+01;
## best it: 101; best obj: 1.211e+00

## It: 326; obj: 1.528e+00; abs: 3.463e-03; rel: 2.261e-03; norm: 5.975e-01; mom: 1.608e+01;

```

```

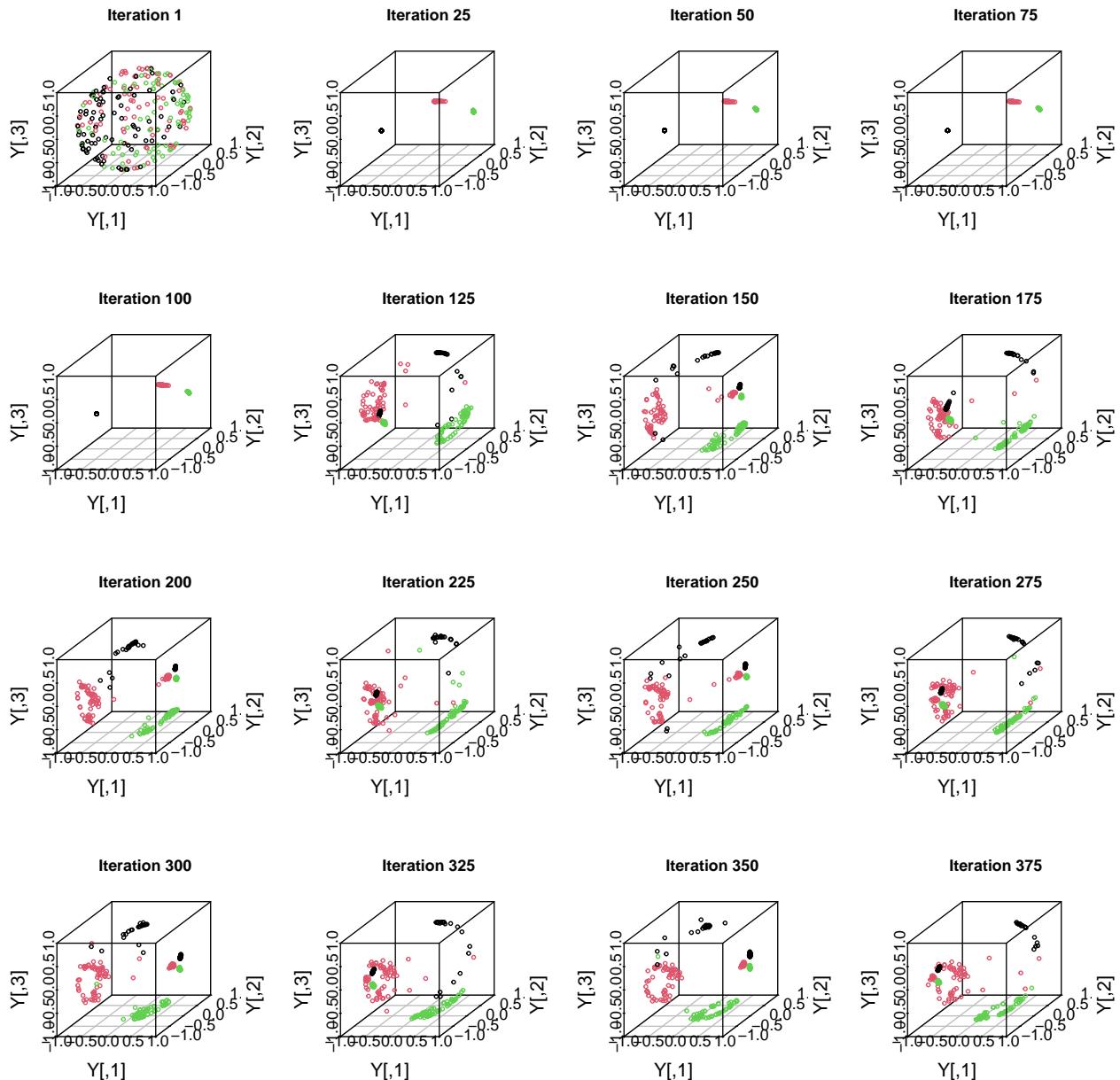
## best it: 101; best obj: 1.211e+00
## It: 327; obj: 1.512e+00; abs: 1.597e-02; rel: 1.045e-02; norm: 6.065e-01; mom: 1.616e+01;
## best it: 101; best obj: 1.211e+00
## It: 328; obj: 1.543e+00; abs: 3.148e-02; rel: 2.082e-02; norm: 6.039e-01; mom: 1.602e+01;
## best it: 101; best obj: 1.211e+00
## It: 329; obj: 1.536e+00; abs: 7.850e-03; rel: 5.086e-03; norm: 6.053e-01; mom: 1.607e+01;
## best it: 101; best obj: 1.211e+00
## It: 330; obj: 1.543e+00; abs: 7.785e-03; rel: 5.069e-03; norm: 6.069e-01; mom: 1.613e+01;
## best it: 101; best obj: 1.211e+00
## It: 331; obj: 1.537e+00; abs: 6.498e-03; rel: 4.210e-03; norm: 6.141e-01; mom: 1.605e+01;
## best it: 101; best obj: 1.211e+00
## It: 332; obj: 1.571e+00; abs: 3.379e-02; rel: 2.198e-02; norm: 6.102e-01; mom: 1.607e+01;
## best it: 101; best obj: 1.211e+00
## It: 333; obj: 1.506e+00; abs: 6.445e-02; rel: 4.103e-02; norm: 6.102e-01; mom: 1.618e+01;
## best it: 101; best obj: 1.211e+00
## It: 334; obj: 1.525e+00; abs: 1.889e-02; rel: 1.254e-02; norm: 6.193e-01; mom: 1.611e+01;
## best it: 101; best obj: 1.211e+00
## It: 335; obj: 1.523e+00; abs: 2.545e-03; rel: 1.668e-03; norm: 6.069e-01; mom: 1.598e+01;
## best it: 101; best obj: 1.211e+00
## It: 336; obj: 1.549e+00; abs: 2.647e-02; rel: 1.738e-02; norm: 6.029e-01; mom: 1.612e+01;
## best it: 101; best obj: 1.211e+00
## It: 337; obj: 1.482e+00; abs: 6.755e-02; rel: 4.361e-02; norm: 6.158e-01; mom: 1.623e+01;
## best it: 101; best obj: 1.211e+00
## It: 338; obj: 1.539e+00; abs: 5.732e-02; rel: 3.869e-02; norm: 6.051e-01; mom: 1.605e+01;
## best it: 101; best obj: 1.211e+00
## It: 339; obj: 1.503e+00; abs: 3.555e-02; rel: 2.310e-02; norm: 5.992e-01; mom: 1.602e+01;
## best it: 101; best obj: 1.211e+00
## It: 340; obj: 1.519e+00; abs: 1.522e-02; rel: 1.012e-02; norm: 6.061e-01; mom: 1.606e+01;
## best it: 101; best obj: 1.211e+00
## It: 341; obj: 1.521e+00; abs: 2.290e-03; rel: 1.508e-03; norm: 5.969e-01; mom: 1.601e+01;
## best it: 101; best obj: 1.211e+00
## It: 342; obj: 1.536e+00; abs: 1.482e-02; rel: 9.744e-03; norm: 6.033e-01; mom: 1.605e+01;
## best it: 101; best obj: 1.211e+00
## It: 343; obj: 1.494e+00; abs: 4.182e-02; rel: 2.723e-02; norm: 6.127e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 344; obj: 1.523e+00; abs: 2.931e-02; rel: 1.962e-02; norm: 6.091e-01; mom: 1.606e+01;
## best it: 101; best obj: 1.211e+00
## It: 345; obj: 1.518e+00; abs: 5.516e-03; rel: 3.621e-03; norm: 5.992e-01; mom: 1.607e+01;
## best it: 101; best obj: 1.211e+00
## It: 346; obj: 1.519e+00; abs: 1.747e-03; rel: 1.151e-03; norm: 6.036e-01; mom: 1.609e+01;
## best it: 101; best obj: 1.211e+00
## It: 347; obj: 1.505e+00; abs: 1.426e-02; rel: 9.382e-03; norm: 6.075e-01; mom: 1.602e+01;
## best it: 101; best obj: 1.211e+00
## It: 348; obj: 1.519e+00; abs: 1.429e-02; rel: 9.497e-03; norm: 5.970e-01; mom: 1.604e+01;
## best it: 101; best obj: 1.211e+00
## It: 349; obj: 1.500e+00; abs: 1.899e-02; rel: 1.250e-02; norm: 6.060e-01; mom: 1.607e+01;
## best it: 101; best obj: 1.211e+00
## It: 350; obj: 1.497e+00; abs: 3.562e-03; rel: 2.374e-03; norm: 6.068e-01; mom: 1.602e+01;
## best it: 101; best obj: 1.211e+00
## It: 351; obj: 1.528e+00; abs: 3.090e-02; rel: 2.064e-02; norm: 5.963e-01; mom: 1.600e+01;
## best it: 101; best obj: 1.211e+00
## It: 352; obj: 1.538e+00; abs: 1.069e-02; rel: 6.997e-03; norm: 5.907e-01; mom: 1.607e+01;
## best it: 101; best obj: 1.211e+00

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## It: 353; obj: 1.515e+00; abs: 2.314e-02; rel: 1.504e-02; norm: 6.069e-01; mom: 1.615e+01;
## best it: 101; best obj: 1.211e+00
## It: 354; obj: 1.496e+00; abs: 1.960e-02; rel: 1.294e-02; norm: 6.077e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 355; obj: 1.537e+00; abs: 4.179e-02; rel: 2.794e-02; norm: 6.007e-01; mom: 1.603e+01;
## best it: 101; best obj: 1.211e+00
## It: 356; obj: 1.511e+00; abs: 2.676e-02; rel: 1.741e-02; norm: 5.970e-01; mom: 1.611e+01;
## best it: 101; best obj: 1.211e+00
## It: 357; obj: 1.508e+00; abs: 2.705e-03; rel: 1.790e-03; norm: 6.012e-01; mom: 1.627e+01;
## best it: 101; best obj: 1.211e+00
## It: 358; obj: 1.525e+00; abs: 1.738e-02; rel: 1.152e-02; norm: 5.949e-01; mom: 1.607e+01;
## best it: 101; best obj: 1.211e+00
## It: 359; obj: 1.509e+00; abs: 1.672e-02; rel: 1.096e-02; norm: 6.016e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 360; obj: 1.506e+00; abs: 3.094e-03; rel: 2.051e-03; norm: 6.008e-01; mom: 1.619e+01;
## best it: 101; best obj: 1.211e+00
## It: 361; obj: 1.537e+00; abs: 3.132e-02; rel: 2.081e-02; norm: 5.985e-01; mom: 1.599e+01;
## best it: 101; best obj: 1.211e+00
## It: 362; obj: 1.504e+00; abs: 3.295e-02; rel: 2.144e-02; norm: 6.037e-01; mom: 1.599e+01;
## best it: 101; best obj: 1.211e+00
## It: 363; obj: 1.532e+00; abs: 2.768e-02; rel: 1.841e-02; norm: 6.122e-01; mom: 1.608e+01;
## best it: 101; best obj: 1.211e+00
## It: 364; obj: 1.543e+00; abs: 1.152e-02; rel: 7.523e-03; norm: 5.971e-01; mom: 1.594e+01;
## best it: 101; best obj: 1.211e+00
## It: 365; obj: 1.556e+00; abs: 1.321e-02; rel: 8.558e-03; norm: 6.119e-01; mom: 1.604e+01;
## best it: 101; best obj: 1.211e+00
## It: 366; obj: 1.524e+00; abs: 3.250e-02; rel: 2.088e-02; norm: 6.213e-01; mom: 1.617e+01;
## best it: 101; best obj: 1.211e+00
## It: 367; obj: 1.535e+00; abs: 1.145e-02; rel: 7.514e-03; norm: 6.277e-01; mom: 1.603e+01;
## best it: 101; best obj: 1.211e+00
## It: 368; obj: 1.501e+00; abs: 3.381e-02; rel: 2.202e-02; norm: 6.119e-01; mom: 1.599e+01;
## best it: 101; best obj: 1.211e+00
## It: 369; obj: 1.530e+00; abs: 2.852e-02; rel: 1.900e-02; norm: 6.100e-01; mom: 1.604e+01;
## best it: 101; best obj: 1.211e+00
## It: 370; obj: 1.507e+00; abs: 2.314e-02; rel: 1.512e-02; norm: 5.938e-01; mom: 1.601e+01;
## best it: 101; best obj: 1.211e+00
## It: 371; obj: 1.551e+00; abs: 4.462e-02; rel: 2.961e-02; norm: 6.127e-01; mom: 1.595e+01;
## best it: 101; best obj: 1.211e+00
## It: 372; obj: 1.510e+00; abs: 4.198e-02; rel: 2.706e-02; norm: 6.076e-01; mom: 1.600e+01;
## best it: 101; best obj: 1.211e+00
## It: 373; obj: 1.539e+00; abs: 2.931e-02; rel: 1.941e-02; norm: 6.104e-01; mom: 1.622e+01;
## best it: 101; best obj: 1.211e+00
## It: 374; obj: 1.504e+00; abs: 3.443e-02; rel: 2.237e-02; norm: 6.005e-01; mom: 1.617e+01;
## best it: 101; best obj: 1.211e+00
## It: 375; obj: 1.547e+00; abs: 4.289e-02; rel: 2.851e-02; norm: 5.990e-01; mom: 1.623e+01;
## best it: 101; best obj: 1.211e+00

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## It: 376; obj: 1.529e+00; abs: 1.871e-02; rel: 1.209e-02; norm: 5.963e-01; mom: 1.621e+01;
## best it: 101; best obj: 1.211e+00
## It: 377; obj: 1.530e+00; abs: 1.783e-03; rel: 1.167e-03; norm: 6.143e-01; mom: 1.614e+01;
## best it: 101; best obj: 1.211e+00
## It: 378; obj: 1.525e+00; abs: 5.535e-03; rel: 3.617e-03; norm: 6.041e-01; mom: 1.613e+01;
## best it: 101; best obj: 1.211e+00
## It: 379; obj: 1.532e+00; abs: 7.277e-03; rel: 4.772e-03; norm: 6.110e-01; mom: 1.616e+01;
## best it: 101; best obj: 1.211e+00
## It: 380; obj: 1.502e+00; abs: 2.962e-02; rel: 1.933e-02; norm: 6.036e-01; mom: 1.614e+01;
## best it: 101; best obj: 1.211e+00
## It: 381; obj: 1.532e+00; abs: 2.928e-02; rel: 1.949e-02; norm: 6.034e-01; mom: 1.606e+01;
## best it: 101; best obj: 1.211e+00
## It: 382; obj: 1.518e+00; abs: 1.376e-02; rel: 8.985e-03; norm: 5.935e-01; mom: 1.603e+01;
## best it: 101; best obj: 1.211e+00
## It: 383; obj: 1.513e+00; abs: 5.289e-03; rel: 3.484e-03; norm: 6.119e-01; mom: 1.611e+01;

```

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## best it: 101; best obj: 1.211e+00
## It: 384; obj: 1.476e+00; abs: 3.669e-02; rel: 2.425e-02; norm: 5.983e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 385; obj: 1.525e+00; abs: 4.926e-02; rel: 3.338e-02; norm: 5.927e-01; mom: 1.605e+01;
## best it: 101; best obj: 1.211e+00
## It: 386; obj: 1.487e+00; abs: 3.782e-02; rel: 2.479e-02; norm: 5.917e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 387; obj: 1.528e+00; abs: 4.027e-02; rel: 2.707e-02; norm: 6.074e-01; mom: 1.606e+01;
## best it: 101; best obj: 1.211e+00
## It: 388; obj: 1.520e+00; abs: 7.716e-03; rel: 5.050e-03; norm: 5.992e-01; mom: 1.590e+01;
## best it: 101; best obj: 1.211e+00
## It: 389; obj: 1.539e+00; abs: 1.902e-02; rel: 1.252e-02; norm: 6.138e-01; mom: 1.612e+01;
## best it: 101; best obj: 1.211e+00
## It: 390; obj: 1.535e+00; abs: 4.347e-03; rel: 2.824e-03; norm: 6.038e-01; mom: 1.612e+01;
## best it: 101; best obj: 1.211e+00
## It: 391; obj: 1.548e+00; abs: 1.303e-02; rel: 8.489e-03; norm: 6.144e-01; mom: 1.616e+01;
## best it: 101; best obj: 1.211e+00
## It: 392; obj: 1.556e+00; abs: 7.799e-03; rel: 5.039e-03; norm: 6.161e-01; mom: 1.607e+01;
## best it: 101; best obj: 1.211e+00
## It: 393; obj: 1.555e+00; abs: 1.349e-04; rel: 8.675e-05; norm: 6.195e-01; mom: 1.614e+01;
## best it: 101; best obj: 1.211e+00
## It: 394; obj: 1.533e+00; abs: 2.219e-02; rel: 1.427e-02; norm: 6.192e-01; mom: 1.621e+01;
## best it: 101; best obj: 1.211e+00
## It: 395; obj: 1.517e+00; abs: 1.630e-02; rel: 1.063e-02; norm: 6.264e-01; mom: 1.604e+01;
## best it: 101; best obj: 1.211e+00
## It: 396; obj: 1.530e+00; abs: 1.284e-02; rel: 8.462e-03; norm: 6.093e-01; mom: 1.595e+01;
## best it: 101; best obj: 1.211e+00
## It: 397; obj: 1.517e+00; abs: 1.231e-02; rel: 8.046e-03; norm: 6.119e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 398; obj: 1.544e+00; abs: 2.634e-02; rel: 1.736e-02; norm: 6.122e-01; mom: 1.596e+01;
## best it: 101; best obj: 1.211e+00
## It: 399; obj: 1.539e+00; abs: 4.986e-03; rel: 3.230e-03; norm: 6.203e-01; mom: 1.599e+01;
## best it: 101; best obj: 1.211e+00
## It: 400; obj: 1.554e+00; abs: 1.477e-02; rel: 9.598e-03; norm: 6.178e-01; mom: 1.609e+01;
## best it: 101; best obj: 1.211e+00
## It: 401; obj: 1.529e+00; abs: 2.461e-02; rel: 1.584e-02; norm: 6.256e-01; mom: 1.604e+01;
## best it: 101; best obj: 1.211e+00
## It: 402; obj: 1.550e+00; abs: 2.106e-02; rel: 1.377e-02; norm: 6.163e-01; mom: 1.601e+01;
## best it: 101; best obj: 1.211e+00
## It: 403; obj: 1.536e+00; abs: 1.447e-02; rel: 9.337e-03; norm: 6.241e-01; mom: 1.607e+01;
## best it: 101; best obj: 1.211e+00
## It: 404; obj: 1.527e+00; abs: 8.146e-03; rel: 5.305e-03; norm: 6.189e-01; mom: 1.609e+01;
## best it: 101; best obj: 1.211e+00
## It: 405; obj: 1.531e+00; abs: 3.674e-03; rel: 2.406e-03; norm: 6.212e-01; mom: 1.604e+01;
## best it: 101; best obj: 1.211e+00
## It: 406; obj: 1.552e+00; abs: 2.114e-02; rel: 1.380e-02; norm: 6.126e-01; mom: 1.593e+01;
## best it: 101; best obj: 1.211e+00
## It: 407; obj: 1.506e+00; abs: 4.654e-02; rel: 2.998e-02; norm: 6.255e-01; mom: 1.605e+01;
## best it: 101; best obj: 1.211e+00
## It: 408; obj: 1.546e+00; abs: 4.009e-02; rel: 2.663e-02; norm: 6.159e-01; mom: 1.600e+01;
## best it: 101; best obj: 1.211e+00
## It: 409; obj: 1.499e+00; abs: 4.684e-02; rel: 3.030e-02; norm: 6.183e-01; mom: 1.598e+01;
## best it: 101; best obj: 1.211e+00

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## It: 410; obj: 1.572e+00; abs: 7.336e-02; rel: 4.894e-02; norm: 6.054e-01; mom: 1.599e+01;
## best it: 101; best obj: 1.211e+00
## It: 411; obj: 1.540e+00; abs: 3.177e-02; rel: 2.021e-02; norm: 6.144e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 412; obj: 1.517e+00; abs: 2.317e-02; rel: 1.504e-02; norm: 6.225e-01; mom: 1.620e+01;
## best it: 101; best obj: 1.211e+00
## It: 413; obj: 1.512e+00; abs: 5.756e-03; rel: 3.793e-03; norm: 6.236e-01; mom: 1.604e+01;
## best it: 101; best obj: 1.211e+00
## It: 414; obj: 1.535e+00; abs: 2.303e-02; rel: 1.523e-02; norm: 6.055e-01; mom: 1.595e+01;
## best it: 101; best obj: 1.211e+00
## It: 415; obj: 1.536e+00; abs: 1.891e-03; rel: 1.233e-03; norm: 6.170e-01; mom: 1.599e+01;
## best it: 101; best obj: 1.211e+00
## It: 416; obj: 1.528e+00; abs: 8.029e-03; rel: 5.226e-03; norm: 6.136e-01; mom: 1.600e+01;
## best it: 101; best obj: 1.211e+00
## It: 417; obj: 1.529e+00; abs: 1.004e-03; rel: 6.568e-04; norm: 6.140e-01; mom: 1.604e+01;
## best it: 101; best obj: 1.211e+00
## It: 418; obj: 1.539e+00; abs: 9.662e-03; rel: 6.317e-03; norm: 6.128e-01; mom: 1.601e+01;
## best it: 101; best obj: 1.211e+00
## It: 419; obj: 1.507e+00; abs: 3.236e-02; rel: 2.103e-02; norm: 6.210e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 420; obj: 1.546e+00; abs: 3.926e-02; rel: 2.606e-02; norm: 6.073e-01; mom: 1.603e+01;
## best it: 101; best obj: 1.211e+00
## It: 421; obj: 1.529e+00; abs: 1.697e-02; rel: 1.098e-02; norm: 6.101e-01; mom: 1.605e+01;
## best it: 101; best obj: 1.211e+00
## It: 422; obj: 1.551e+00; abs: 2.174e-02; rel: 1.422e-02; norm: 6.153e-01; mom: 1.614e+01;
## best it: 101; best obj: 1.211e+00
## It: 423; obj: 1.525e+00; abs: 2.553e-02; rel: 1.646e-02; norm: 6.174e-01; mom: 1.613e+01;
## best it: 101; best obj: 1.211e+00
## It: 424; obj: 1.536e+00; abs: 1.101e-02; rel: 7.221e-03; norm: 6.075e-01; mom: 1.613e+01;
## best it: 101; best obj: 1.211e+00
## It: 425; obj: 1.518e+00; abs: 1.862e-02; rel: 1.212e-02; norm: 6.201e-01; mom: 1.609e+01;
## best it: 101; best obj: 1.211e+00

## It: 426; obj: 1.537e+00; abs: 1.950e-02; rel: 1.285e-02; norm: 6.077e-01; mom: 1.606e+01;
## best it: 101; best obj: 1.211e+00
## It: 427; obj: 1.551e+00; abs: 1.399e-02; rel: 9.104e-03; norm: 6.054e-01; mom: 1.602e+01;
## best it: 101; best obj: 1.211e+00
## It: 428; obj: 1.540e+00; abs: 1.104e-02; rel: 7.115e-03; norm: 6.163e-01; mom: 1.609e+01;
## best it: 101; best obj: 1.211e+00
## It: 429; obj: 1.519e+00; abs: 2.095e-02; rel: 1.360e-02; norm: 6.284e-01; mom: 1.615e+01;
## best it: 101; best obj: 1.211e+00
## It: 430; obj: 1.532e+00; abs: 1.286e-02; rel: 8.467e-03; norm: 6.074e-01; mom: 1.608e+01;
## best it: 101; best obj: 1.211e+00
## It: 431; obj: 1.537e+00; abs: 5.394e-03; rel: 3.521e-03; norm: 6.152e-01; mom: 1.603e+01;
## best it: 101; best obj: 1.211e+00
## It: 432; obj: 1.519e+00; abs: 1.807e-02; rel: 1.175e-02; norm: 6.111e-01; mom: 1.608e+01;
## best it: 101; best obj: 1.211e+00
## It: 433; obj: 1.521e+00; abs: 1.835e-03; rel: 1.208e-03; norm: 6.172e-01; mom: 1.609e+01;
## best it: 101; best obj: 1.211e+00
## It: 434; obj: 1.528e+00; abs: 7.082e-03; rel: 4.656e-03; norm: 6.060e-01; mom: 1.602e+01;
## best it: 101; best obj: 1.211e+00
## It: 435; obj: 1.527e+00; abs: 1.567e-03; rel: 1.025e-03; norm: 6.149e-01; mom: 1.607e+01;
## best it: 101; best obj: 1.211e+00
## It: 436; obj: 1.552e+00; abs: 2.555e-02; rel: 1.674e-02; norm: 6.073e-01; mom: 1.607e+01;

```

```

## best it: 101; best obj: 1.211e+00
## It: 437; obj: 1.518e+00; abs: 3.430e-02; rel: 2.210e-02; norm: 6.178e-01; mom: 1.612e+01;
## best it: 101; best obj: 1.211e+00
## It: 438; obj: 1.558e+00; abs: 4.030e-02; rel: 2.655e-02; norm: 6.138e-01; mom: 1.613e+01;
## best it: 101; best obj: 1.211e+00
## It: 439; obj: 1.536e+00; abs: 2.235e-02; rel: 1.434e-02; norm: 6.159e-01; mom: 1.606e+01;
## best it: 101; best obj: 1.211e+00
## It: 440; obj: 1.537e+00; abs: 1.504e-03; rel: 9.793e-04; norm: 6.179e-01; mom: 1.614e+01;
## best it: 101; best obj: 1.211e+00
## It: 441; obj: 1.533e+00; abs: 3.934e-03; rel: 2.559e-03; norm: 6.230e-01; mom: 1.606e+01;
## best it: 101; best obj: 1.211e+00
## It: 442; obj: 1.534e+00; abs: 2.546e-04; rel: 1.661e-04; norm: 6.111e-01; mom: 1.607e+01;
## best it: 101; best obj: 1.211e+00
## It: 443; obj: 1.535e+00; abs: 1.376e-03; rel: 8.975e-04; norm: 6.112e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 444; obj: 1.517e+00; abs: 1.796e-02; rel: 1.170e-02; norm: 6.131e-01; mom: 1.615e+01;
## best it: 101; best obj: 1.211e+00
## It: 445; obj: 1.533e+00; abs: 1.579e-02; rel: 1.041e-02; norm: 6.146e-01; mom: 1.607e+01;
## best it: 101; best obj: 1.211e+00
## It: 446; obj: 1.528e+00; abs: 5.098e-03; rel: 3.326e-03; norm: 6.053e-01; mom: 1.603e+01;
## best it: 101; best obj: 1.211e+00
## It: 447; obj: 1.534e+00; abs: 6.268e-03; rel: 4.103e-03; norm: 6.181e-01; mom: 1.614e+01;
## best it: 101; best obj: 1.211e+00
## It: 448; obj: 1.532e+00; abs: 2.522e-03; rel: 1.644e-03; norm: 6.071e-01; mom: 1.613e+01;
## best it: 101; best obj: 1.211e+00
## It: 449; obj: 1.524e+00; abs: 7.664e-03; rel: 5.004e-03; norm: 6.150e-01; mom: 1.614e+01;
## best it: 101; best obj: 1.211e+00
## It: 450; obj: 1.513e+00; abs: 1.057e-02; rel: 6.938e-03; norm: 6.097e-01; mom: 1.609e+01;
## best it: 101; best obj: 1.211e+00

## It: 451; obj: 1.542e+00; abs: 2.841e-02; rel: 1.877e-02; norm: 6.114e-01; mom: 1.602e+01;
## best it: 101; best obj: 1.211e+00
## It: 452; obj: 1.519e+00; abs: 2.272e-02; rel: 1.474e-02; norm: 6.072e-01; mom: 1.613e+01;
## best it: 101; best obj: 1.211e+00
## It: 453; obj: 1.536e+00; abs: 1.678e-02; rel: 1.105e-02; norm: 6.106e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 454; obj: 1.503e+00; abs: 3.256e-02; rel: 2.120e-02; norm: 6.069e-01; mom: 1.601e+01;
## best it: 101; best obj: 1.211e+00
## It: 455; obj: 1.537e+00; abs: 3.352e-02; rel: 2.230e-02; norm: 6.173e-01; mom: 1.592e+01;
## best it: 101; best obj: 1.211e+00
## It: 456; obj: 1.494e+00; abs: 4.280e-02; rel: 2.785e-02; norm: 6.060e-01; mom: 1.602e+01;
## best it: 101; best obj: 1.211e+00
## It: 457; obj: 1.547e+00; abs: 5.328e-02; rel: 3.566e-02; norm: 6.100e-01; mom: 1.599e+01;
## best it: 101; best obj: 1.211e+00
## It: 458; obj: 1.500e+00; abs: 4.715e-02; rel: 3.047e-02; norm: 6.116e-01; mom: 1.591e+01;
## best it: 101; best obj: 1.211e+00
## It: 459; obj: 1.523e+00; abs: 2.335e-02; rel: 1.556e-02; norm: 6.206e-01; mom: 1.609e+01;
## best it: 101; best obj: 1.211e+00
## It: 460; obj: 1.535e+00; abs: 1.122e-02; rel: 7.368e-03; norm: 6.014e-01; mom: 1.601e+01;
## best it: 101; best obj: 1.211e+00
## It: 461; obj: 1.526e+00; abs: 8.879e-03; rel: 5.785e-03; norm: 6.228e-01; mom: 1.609e+01;
## best it: 101; best obj: 1.211e+00
## It: 462; obj: 1.515e+00; abs: 1.108e-02; rel: 7.261e-03; norm: 6.123e-01; mom: 1.605e+01;
## best it: 101; best obj: 1.211e+00

```

```

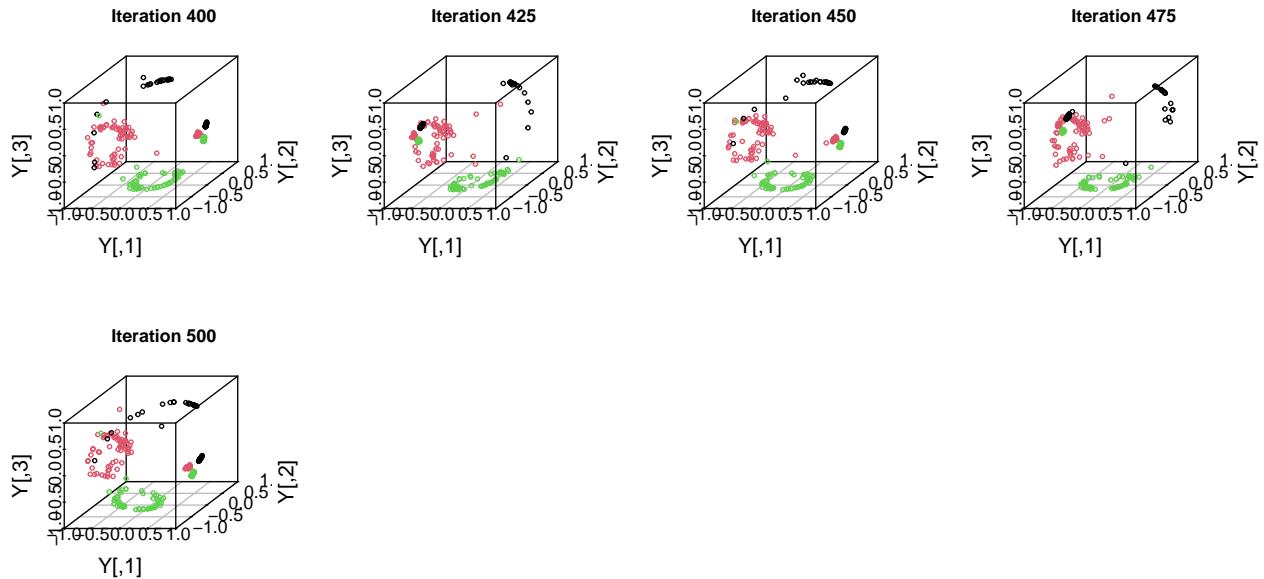
## It: 463; obj: 1.524e+00; abs: 8.986e-03; rel: 5.932e-03; norm: 6.136e-01; mom: 1.602e+01;
## best it: 101; best obj: 1.211e+00
## It: 464; obj: 1.514e+00; abs: 9.736e-03; rel: 6.389e-03; norm: 6.084e-01; mom: 1.602e+01;
## best it: 101; best obj: 1.211e+00
## It: 465; obj: 1.511e+00; abs: 3.295e-03; rel: 2.177e-03; norm: 6.177e-01; mom: 1.607e+01;
## best it: 101; best obj: 1.211e+00
## It: 466; obj: 1.538e+00; abs: 2.683e-02; rel: 1.776e-02; norm: 6.073e-01; mom: 1.594e+01;
## best it: 101; best obj: 1.211e+00
## It: 467; obj: 1.526e+00; abs: 1.140e-02; rel: 7.416e-03; norm: 6.149e-01; mom: 1.602e+01;
## best it: 101; best obj: 1.211e+00
## It: 468; obj: 1.537e+00; abs: 1.053e-02; rel: 6.901e-03; norm: 6.151e-01; mom: 1.608e+01;
## best it: 101; best obj: 1.211e+00
## It: 469; obj: 1.530e+00; abs: 6.792e-03; rel: 4.420e-03; norm: 6.262e-01; mom: 1.601e+01;
## best it: 101; best obj: 1.211e+00
## It: 470; obj: 1.511e+00; abs: 1.911e-02; rel: 1.249e-02; norm: 6.131e-01; mom: 1.603e+01;
## best it: 101; best obj: 1.211e+00
## It: 471; obj: 1.531e+00; abs: 2.014e-02; rel: 1.333e-02; norm: 6.122e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 472; obj: 1.517e+00; abs: 1.380e-02; rel: 9.013e-03; norm: 6.026e-01; mom: 1.608e+01;
## best it: 101; best obj: 1.211e+00
## It: 473; obj: 1.504e+00; abs: 1.353e-02; rel: 8.918e-03; norm: 6.141e-01; mom: 1.614e+01;
## best it: 101; best obj: 1.211e+00
## It: 474; obj: 1.524e+00; abs: 2.063e-02; rel: 1.372e-02; norm: 6.015e-01; mom: 1.606e+01;
## best it: 101; best obj: 1.211e+00
## It: 475; obj: 1.494e+00; abs: 2.973e-02; rel: 1.951e-02; norm: 6.064e-01; mom: 1.598e+01;
## best it: 101; best obj: 1.211e+00
## It: 476; obj: 1.487e+00; abs: 7.148e-03; rel: 4.783e-03; norm: 6.082e-01; mom: 1.611e+01;
## best it: 101; best obj: 1.211e+00
## It: 477; obj: 1.508e+00; abs: 2.105e-02; rel: 1.415e-02; norm: 6.055e-01; mom: 1.605e+01;
## best it: 101; best obj: 1.211e+00
## It: 478; obj: 1.515e+00; abs: 6.695e-03; rel: 4.439e-03; norm: 5.958e-01; mom: 1.599e+01;
## best it: 101; best obj: 1.211e+00
## It: 479; obj: 1.487e+00; abs: 2.784e-02; rel: 1.837e-02; norm: 6.123e-01; mom: 1.607e+01;
## best it: 101; best obj: 1.211e+00
## It: 480; obj: 1.513e+00; abs: 2.600e-02; rel: 1.748e-02; norm: 6.031e-01; mom: 1.606e+01;
## best it: 101; best obj: 1.211e+00
## It: 481; obj: 1.493e+00; abs: 2.036e-02; rel: 1.345e-02; norm: 6.061e-01; mom: 1.606e+01;
## best it: 101; best obj: 1.211e+00
## It: 482; obj: 1.502e+00; abs: 9.107e-03; rel: 6.101e-03; norm: 6.047e-01; mom: 1.605e+01;
## best it: 101; best obj: 1.211e+00
## It: 483; obj: 1.505e+00; abs: 2.988e-03; rel: 1.989e-03; norm: 6.029e-01; mom: 1.601e+01;
## best it: 101; best obj: 1.211e+00
## It: 484; obj: 1.532e+00; abs: 2.710e-02; rel: 1.801e-02; norm: 6.000e-01; mom: 1.605e+01;
## best it: 101; best obj: 1.211e+00
## It: 485; obj: 1.495e+00; abs: 3.694e-02; rel: 2.411e-02; norm: 6.144e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 486; obj: 1.515e+00; abs: 1.959e-02; rel: 1.310e-02; norm: 6.018e-01; mom: 1.610e+01;
## best it: 101; best obj: 1.211e+00
## It: 487; obj: 1.497e+00; abs: 1.788e-02; rel: 1.180e-02; norm: 6.060e-01; mom: 1.603e+01;
## best it: 101; best obj: 1.211e+00
## It: 488; obj: 1.508e+00; abs: 1.146e-02; rel: 7.656e-03; norm: 6.054e-01; mom: 1.606e+01;
## best it: 101; best obj: 1.211e+00
## It: 489; obj: 1.508e+00; abs: 7.143e-04; rel: 4.736e-04; norm: 6.063e-01; mom: 1.607e+01;

```

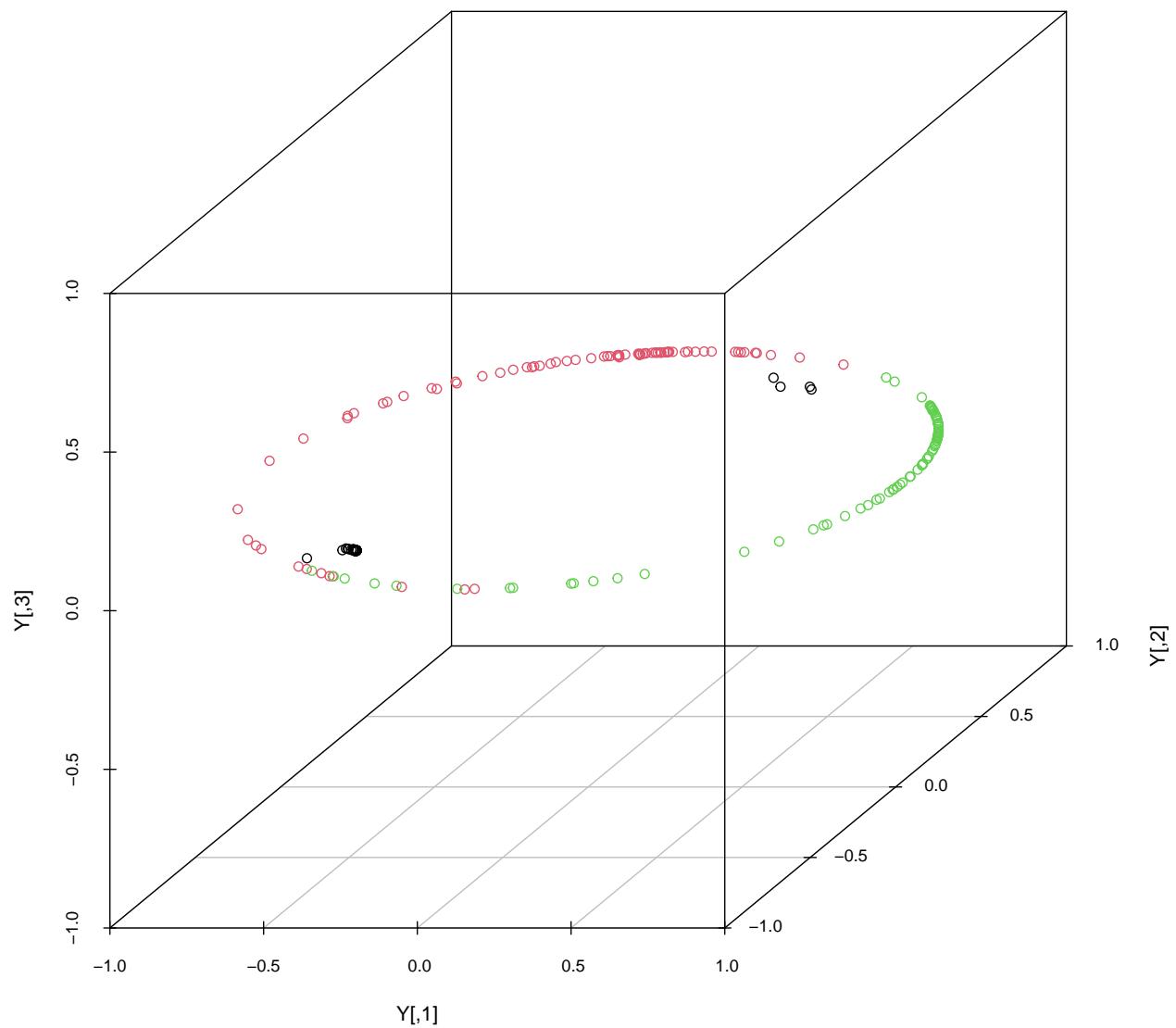
```

## best it: 101; best obj: 1.211e+00
## It: 490; obj: 1.535e+00; abs: 2.721e-02; rel: 1.805e-02; norm: 6.050e-01; mom: 1.601e+01;
## best it: 101; best obj: 1.211e+00
## It: 491; obj: 1.521e+00; abs: 1.380e-02; rel: 8.993e-03; norm: 6.205e-01; mom: 1.595e+01;
## best it: 101; best obj: 1.211e+00
## It: 492; obj: 1.539e+00; abs: 1.771e-02; rel: 1.164e-02; norm: 6.127e-01; mom: 1.609e+01;
## best it: 101; best obj: 1.211e+00
## It: 493; obj: 1.533e+00; abs: 5.586e-03; rel: 3.630e-03; norm: 6.222e-01; mom: 1.604e+01;
## best it: 101; best obj: 1.211e+00
## It: 494; obj: 1.518e+00; abs: 1.511e-02; rel: 9.855e-03; norm: 6.198e-01; mom: 1.598e+01;
## best it: 101; best obj: 1.211e+00
## It: 495; obj: 1.515e+00; abs: 2.684e-03; rel: 1.768e-03; norm: 6.254e-01; mom: 1.603e+01;
## best it: 101; best obj: 1.211e+00
## It: 496; obj: 1.550e+00; abs: 3.426e-02; rel: 2.261e-02; norm: 6.100e-01; mom: 1.596e+01;
## best it: 101; best obj: 1.211e+00
## It: 497; obj: 1.492e+00; abs: 5.767e-02; rel: 3.721e-02; norm: 6.229e-01; mom: 1.602e+01;
## best it: 101; best obj: 1.211e+00
## It: 498; obj: 1.550e+00; abs: 5.778e-02; rel: 3.873e-02; norm: 6.132e-01; mom: 1.600e+01;
## best it: 101; best obj: 1.211e+00
## It: 499; obj: 1.492e+00; abs: 5.736e-02; rel: 3.701e-02; norm: 6.169e-01; mom: 1.599e+01;
## best it: 101; best obj: 1.211e+00
## It: 500; obj: 1.526e+00; abs: 3.371e-02; rel: 2.259e-02; norm: 6.192e-01; mom: 1.590e+01;
## best it: 101; best obj: 1.211e+00

```



### Iteration 101



```
Y <- res_pscsne$best_Y
```

```
scatterplot3d::scatterplot3d(Y, xlim = c(-1, 1), ylim = c(-1, 1), zlim = c(-1, 1),
color = colors)
```

