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```
% HW 3 Problem 3(a)
% Find all the roots of the system

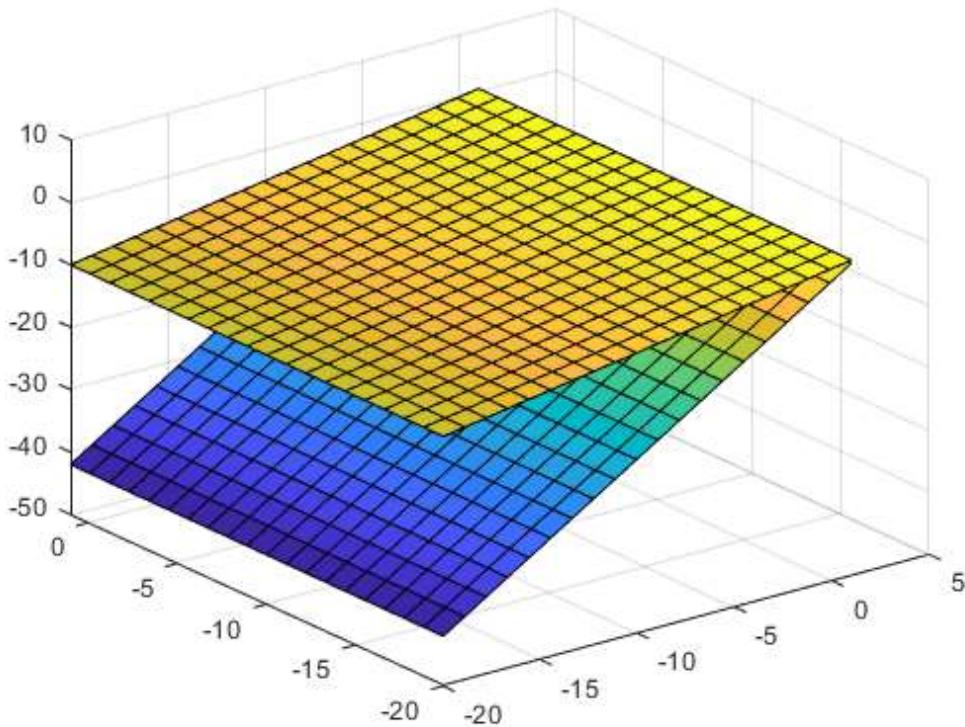
clear
clc
close all
```

Define the function & plot it

```
fm = @(x,y) x^2 + y^2 - (2*x + y);
gm = @(x,y) x^2/4 + y^2 - 1;
gradfm = @grad_p3a_f;
gradgm = @grad_p3a_g;

x = linspace(-20,1,20);
y = linspace(-20,1,20);
[X,Y] = meshgrid(x,y);
F = gradfm(X,Y);
G = gradgm(X,Y);

figure;
surf(X,Y,F);
hold on;
surf(X,Y,G);
```



Find Root #1

```
i = 1;
x0 = -2i;
y0 = 3i;

% Newton's method for multi-variable nonlinear equations
[xm(i,1),ym(i,1),it2D(i,1),success2D(i,1)] = newton2D_exact(fm,gradfm,gm,gradgm,x0,y0,100,1e-6,true)
% Adding root to the plot
plot3(xm(i,1),ym(i,1),0,'bd','MarkerSize',32,'LineWidth',8);
hold on
```

```
iteration: 1; x: -0.707692 + -0.261538 i; y: -0.117949 + 1.456410 i; f: -0.141460, g: -2.999112
iteration: 2; x: -0.329965 + -0.556151 i; y: -0.138639 + 0.369349 i; f: 0.480945, g: -1.167304
iteration: 3; x: 0.161409 + -0.348715 i; y: -0.453574 + -1.124314 i; f: -1.023146, g: -2.082240
iteration: 4; x: 0.580900 + 0.802475 i; y: -0.351780 + -0.261562 i; f: -1.061208, g: -1.021296
iteration: 5; x: 0.604815 + 0.393684 i; y: -0.920503 + 0.599031 i; f: 0.410175, g: -0.458808
iteration: 6; x: 1.817109 + -0.334795 i; y: -0.661231 + 0.243350 i; f: 0.594817, g: 0.175456
iteration: 7; x: 1.202519 + 0.037441 i; y: -0.829430 + 0.041616 i; f: 0.555264, g: 0.047384
iteration: 8; x: -2.138784 + 2.826050 i; y: -2.087649 + 0.923474 i; f: 6.458529, g: 1.652432
iteration: 9; x: 0.067235 + 1.403252 i; y: -1.628078 + 0.590458 i; f: 1.831009, g: 0.810847
iteration: 10; x: 1.423102 + 0.944474 i; y: -1.215784 + 0.451436 i; f: 0.777104, g: 0.557633
iteration: 11; x: 1.639543 + 1.310172 i; y: -1.012509 + 0.500910 i; f: -0.520763, g: 0.017151
iteration: 12; x: 1.666220 + 1.089416 i; y: -0.919283 + 0.495770 i; f: -0.224401, g: -0.003341
iteration: 13; x: 1.692108 + 0.985024 i; y: -0.870199 + 0.480485 i; f: -0.094681, g: -0.000381
iteration: 14; x: 1.694098 + 0.931318 i; y: -0.846476 + 0.466401 i; f: -0.040116, g: -0.000356
iteration: 15; x: 1.687928 + 0.903162 i; y: -0.836212 + 0.455845 i; f: -0.014789, g: -0.000195
iteration: 16; x: 1.680689 + 0.889498 i; y: -0.832521 + 0.448929 i; f: -0.003792, g: -0.000068
iteration: 17; x: 1.674924 + 0.883597 i; y: -0.831698 + 0.444854 i; f: 0.000304, g: -0.000016
iteration: 18; x: 1.671088 + 0.881489 i; y: -0.831910 + 0.442667 i; f: 0.001366, g: -0.000002
iteration: 19; x: 1.668825 + 0.881019 i; y: -0.832354 + 0.441598 i; f: 0.001291, g: 0.000000
iteration: 20; x: 1.667613 + 0.881133 i; y: -0.832743 + 0.441129 i; f: 0.000921, g: 0.000000
```

```
iteration: 21; x: 1.667021 + 0.881377 i; y: -0.833011 + 0.440953 i; f: 0.000568, g: 0.000000
iteration: 22; x: 1.666761 + 0.881591 i; y: -0.833172 + 0.440906 i; f: 0.000317, g: 0.000000
iteration: 23; x: 1.666664 + 0.881739 i; y: -0.833260 + 0.440907 i; f: 0.000161, g: 0.000000
iteration: 24; x: 1.666638 + 0.881828 i; y: -0.833305 + 0.440922 i; f: 0.000075, g: -0.000000
iteration: 25; x: 1.666639 + 0.881877 i; y: -0.833325 + 0.440936 i; f: 0.000030, g: -0.000000
iteration: 26; x: 1.666646 + 0.881901 i; y: -0.833332 + 0.440946 i; f: 0.000010, g: -0.000000
iteration: 27; x: 1.666654 + 0.881912 i; y: -0.833335 + 0.440952 i; f: 0.000002, g: -0.000000
iteration: 28; x: 1.666660 + 0.881917 i; y: -0.833335 + 0.440955 i; f: -0.000001, g: -0.000000
iteration: 29; x: 1.666663 + 0.881918 i; y: -0.833335 + 0.440957 i; f: -0.000002, g: -0.000000
iteration: 30; x: 1.666665 + 0.881918 i; y: -0.833334 + 0.440958 i; f: -0.000001, g: 0.000000
iteration: 31; x: 1.666666 + 0.881918 i; y: -0.833334 + 0.440958 i; f: -0.000001, g: 0.000000
```

xm =

1.6667 + 0.8819i

ym =

-0.8333 + 0.4410i

it2D =

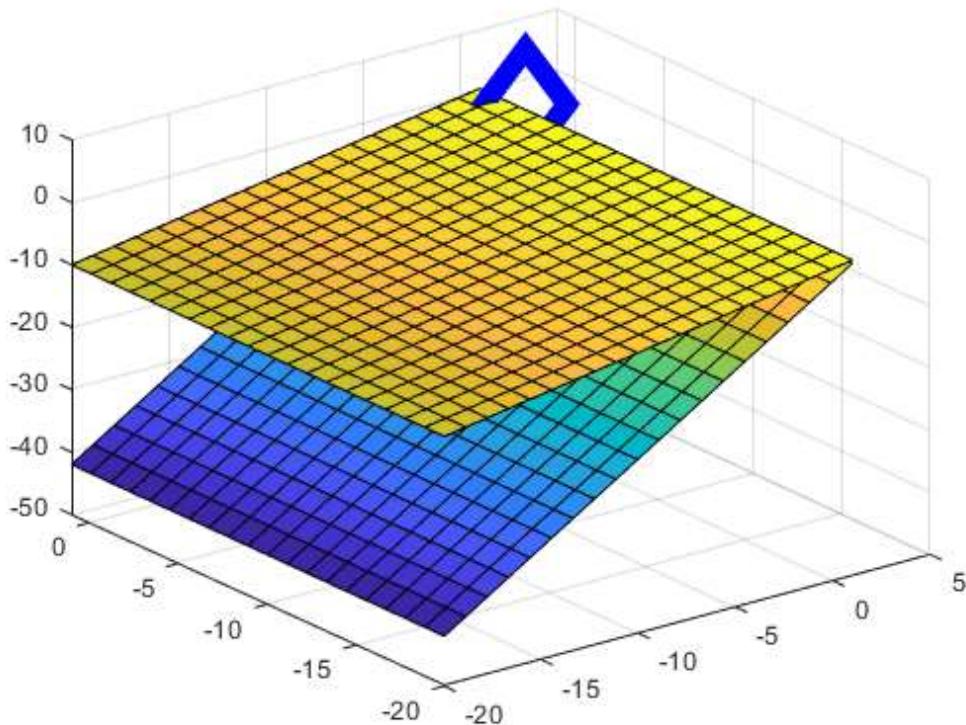
31

success2D =

logical

1

Warning: Imaginary parts of complex X, Y, and/or Z arguments ignored



Find Root #2

```
i = i + 1;
x0 = -0.5;
y0 = 0.7;

% Newton's method for multi-variable nonlinear equations
[xm(i,1),ym(i,1),it2D(i,1),success2D(i,1)] = newton2D_exact(fm,gradfm,gm,gradgm,x0,y0,100,1e-6,true)
% Adding root to the plot
plot3(xm(i,1),ym(i,1),0,'ro','MarkerSize',32,'LineWidth',8);
hold on
```

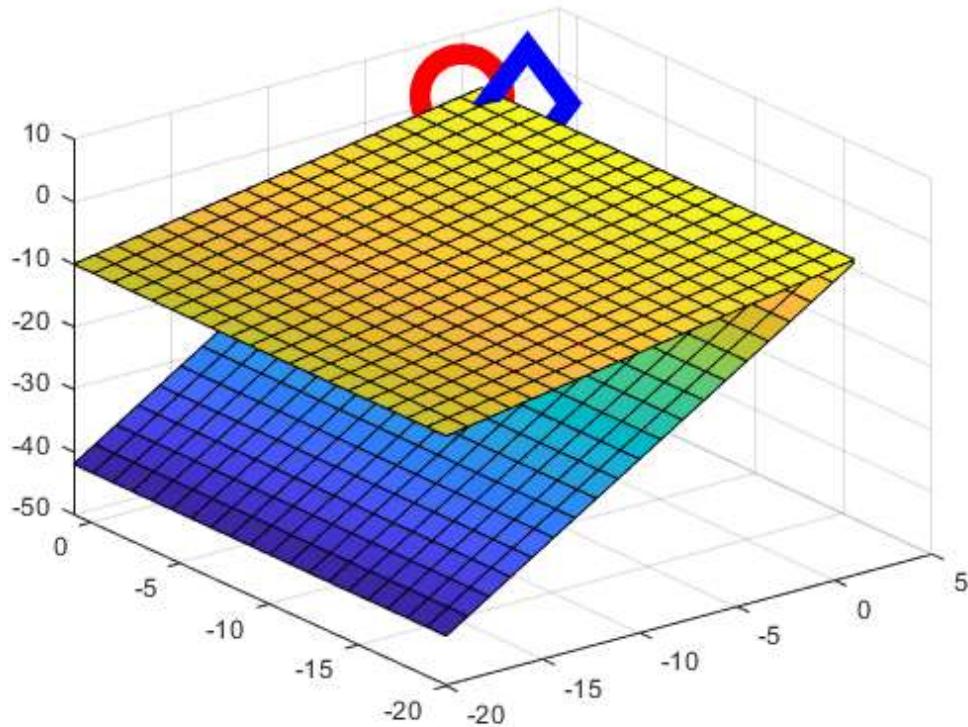
```
iteration: 1; x: -0.060435 + 0.000000 i; y: 1.098137 + 0.000000 i; f: 0.232289, g: 0.206817
iteration: 2; x: 0.000769 + 0.000000 i; y: 1.004811 + 0.000000 i; f: 0.003297, g: 0.009646
iteration: 3; x: 0.000006 + 0.000000 i; y: 1.000012 + 0.000000 i; f: 0.000001, g: 0.000023
iteration: 4; x: 0.000000 + 0.000000 i; y: 1.000000 + 0.000000 i; f: 0.000000, g: 0.000000
```

```
xm =
1.6667 + 0.8819i
0.0000 + 0.0000i
```

```
ym =
-0.8333 + 0.4410i
1.0000 + 0.0000i
```

```
it2D =
```

```
success2D =
2×1 logical array
1
1
```



Find Root #3

```
i = i + 1;
x0 = 3 + 6i;
y0 = 5 - 7i;

% Newton's method for multi-variable nonlinear equations
[xm(i,1),ym(i,1),it2D(i,1),success2D(i,1)] = newton2D_exact(fm,gradfm,gm,gradgm,x0,y0,100,1e-6,true)
% Adding root to the plot
plot3(xm(i,1),ym(i,1),0,'go','MarkerSize',32,'LineWidth',8);
hold on
```

```
iteration: 1; x: 4.979565 + 2.219865 i; y: 2.716762 + -4.123383 i; f: -2.429120, g: -5.654430
iteration: 2; x: 4.429904 + 1.372333 i; y: 1.398530 + -2.517311 i; f: 3.101445, g: -0.945780
iteration: 3; x: 3.474867 + 0.573128 i; y: 0.634945 + -1.593995 i; f: 2.023880, g: -0.201109
iteration: 4; x: 2.818075 + 0.018831 i; y: 0.172471 + -1.038569 i; f: 1.083690, g: -0.063582
iteration: 5; x: 2.434117 + -0.288847 i; y: -0.140933 + -0.696848 i; f: 0.648458, g: -0.005362
iteration: 6; x: 2.173117 + -0.410225 i; y: -0.371186 + -0.499069 i; f: 0.467814, g: 0.027247
iteration: 7; x: 1.945135 + -0.470330 i; y: -0.543367 + -0.393899 i; f: 0.355527, g: 0.030676
iteration: 8; x: 1.748522 + -0.548266 i; y: -0.677029 + -0.351227 i; f: 0.271725, g: 0.024190
```

```
iteration: 9; x: 1.617601 + -0.674237 i; y: -0.773195 + -0.358934 i; f: 0.169028, g: 0.009507
iteration: 10; x: 1.595295 + -0.797757 i; y: -0.820303 + -0.390516 i; f: 0.058657, g: -0.002468
iteration: 11; x: 1.619821 + -0.854566 i; y: -0.835072 + -0.414414 i; f: 0.014573, g: -0.001009
iteration: 12; x: 1.639588 + -0.875681 i; y: -0.838289 + -0.428108 i; f: -0.000004, g: -0.000191
iteration: 13; x: 1.652288 + -0.882945 i; y: -0.837770 + -0.435314 i; f: -0.003983, g: -0.000025
iteration: 14; x: 1.659644 + -0.884619 i; y: -0.836416 + -0.438813 i; f: -0.003969, g: 0.000002
iteration: 15; x: 1.663561 + -0.884343 i; y: -0.835208 + -0.440355 i; f: -0.002882, g: 0.000003
iteration: 16; x: 1.665480 + -0.883610 i; y: -0.834367 + -0.440943 i; f: -0.001799, g: 0.000001
iteration: 17; x: 1.666331 + -0.882949 i; y: -0.833855 + -0.441110 i; f: -0.001012, g: 0.000000
iteration: 18; x: 1.666657 + -0.882487 i; y: -0.833572 + -0.441115 i; f: -0.000521, g: 0.000000
iteration: 19; x: 1.666749 + -0.882205 i; y: -0.833429 + -0.441074 i; f: -0.000244, g: 0.000000
iteration: 20; x: 1.666752 + -0.882049 i; y: -0.833364 + -0.441031 i; f: -0.000101, g: -0.000000
iteration: 21; x: 1.666730 + -0.881970 i; y: -0.833337 + -0.441000 i; f: -0.000034, g: -0.000000
iteration: 22; x: 1.666707 + -0.881934 i; y: -0.833329 + -0.440980 i; f: -0.000007, g: -0.000000
iteration: 23; x: 1.666689 + -0.881919 i; y: -0.833328 + -0.440969 i; f: 0.000003, g: -0.000000
iteration: 24; x: 1.666678 + -0.881915 i; y: -0.833329 + -0.440963 i; f: 0.000005, g: -0.000000
iteration: 25; x: 1.666672 + -0.881914 i; y: -0.833331 + -0.440960 i; f: 0.000004, g: 0.000000
iteration: 26; x: 1.666669 + -0.881915 i; y: -0.833332 + -0.440959 i; f: 0.000003, g: 0.000000
iteration: 27; x: 1.666667 + -0.881916 i; y: -0.833332 + -0.440958 i; f: 0.000002, g: 0.000000
iteration: 28; x: 1.666667 + -0.881916 i; y: -0.833333 + -0.440958 i; f: 0.000001, g: 0.000000
```

xm =

```
1.6667 + 0.8819i
0.0000 + 0.0000i
1.6667 - 0.8819i
```

ym =

```
-0.8333 + 0.4410i
1.0000 + 0.0000i
-0.8333 - 0.4410i
```

it2D =

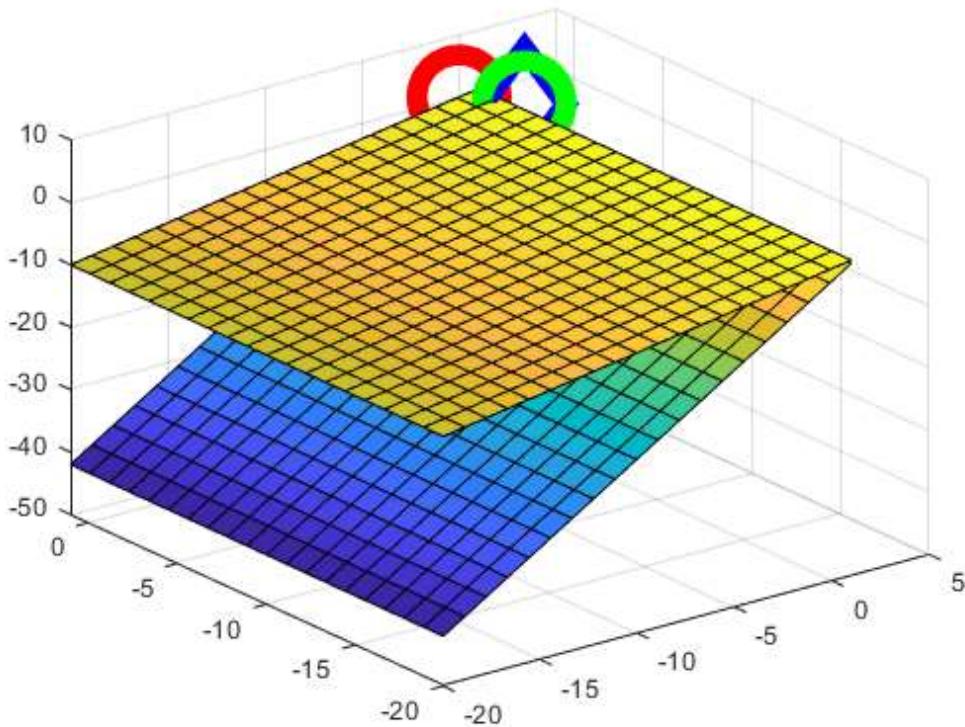
```
31
4
28
```

success2D =

3x1 logical array

```
1
1
1
```

Warning: Imaginary parts of complex X, Y, and/or Z arguments ignored



Find Root #4

```
i = i + 1;
x0 = 2;
y0 = 0.000003;

% Newton's method for multi-variable nonlinear equations
[xm(i,1),ym(i,1),it2D(i,1),success2D(i,1)] = newton2D_exact(fm,gradfm,gm,gradgm,x0,y0,1000,1e-6,true)
% Adding root to the plot
plot3(xm(i,1),ym(i,1),0,'md','MarkerSize',32,'LineWidth',8);
```

```
iteration: 1; x: 2.000002 + 0.000000 i; y: -0.333331 + 0.000000 i; f: 0.444445, g: 0.111112
iteration: 2; x: 1.740743 + 0.000000 i; y: -0.555554 + 0.000000 i; f: 0.412894, g: 0.066187
iteration: 3; x: 1.377749 + 0.000000 i; y: -0.780332 + 0.000000 i; f: 0.531945, g: 0.083467
iteration: 4; x: 0.185197 + 0.000000 i; y: -1.253241 + 0.000000 i; f: 2.487758, g: 0.579188
iteration: 5; x: 1.496826 + 0.000000 i; y: -0.973709 + 0.000000 i; f: 1.168653, g: 0.508231
iteration: 6; x: 0.020443 + 0.000000 i; y: -1.280121 + 0.000000 i; f: 2.878365, g: 0.638816
iteration: 7; x: 1.323225 + 0.000000 i; y: -1.025407 + 0.000000 i; f: 1.181340, g: 0.489190
iteration: 8; x: -1.644511 + 0.000000 i; y: -1.744293 + 0.000000 i; f: 10.780289, g: 2.718661
iteration: 9; x: 0.286846 + 0.000000 i; y: -1.420210 + 0.000000 i; f: 2.945793, g: 1.037565
iteration: 10; x: 1.906993 + 0.000000 i; y: -0.973116 + 0.000000 i; f: 1.742708, g: 0.856111
iteration: 11; x: 0.923882 + 0.000000 i; y: -1.014880 + 0.000000 i; f: 1.050656, g: 0.243371
iteration: 12; x: 3.348081 + 0.000000 i; y: -0.343270 + 0.000000 i; f: 4.974588, g: 1.920246
iteration: 13; x: 2.307833 + 0.000000 i; y: -0.082793 + 0.000000 i; f: 0.800074, g: 0.338378
iteration: 14; x: 1.998379 + 0.000000 i; y: -0.195760 + 0.000000 i; f: 0.230843, g: 0.036702
iteration: 15; x: 1.856449 + 0.000000 i; y: -0.464234 + 0.000000 i; f: 0.413253, g: 0.077114
iteration: 16; x: 1.556402 + 0.000000 i; y: -0.681148 + 0.000000 i; f: 0.454693, g: 0.069559
iteration: 17; x: 0.976173 + 0.000000 i; y: -0.961539 + 0.000000 i; f: 0.886664, g: 0.162786
iteration: 18; x: 3.736812 + 0.000000 i; y: -0.176227 + 0.000000 i; f: 6.697423, g: 2.521997
iteration: 19; x: 2.539209 + 0.000000 i; y: 0.630653 + 0.000000 i; f: 1.136235, g: 1.009619
iteration: 20; x: 2.280811 + 0.000000 i; y: 0.090296 + 0.000000 i; f: 0.558334, g: 0.308678
iteration: 21; x: 2.077943 + 0.000000 i; y: -0.337886 + 0.000000 i; f: 0.614015, g: 0.193629
```

iteration: 22; x: 1.761883 + 0.000000 i; y: -0.537285 + 0.000000 i; f: 0.406426, g: 0.064733
iteration: 23; x: 1.416586 + 0.000000 i; y: -0.760122 + 0.000000 i; f: 0.511451, g: 0.079464
iteration: 24; x: 0.431838 + 0.000000 i; y: -1.166652 + 0.000000 i; f: 1.850538, g: 0.407699
iteration: 25; x: 1.755242 + 0.000000 i; y: -0.869457 + 0.000000 i; f: 1.195803, g: 0.526174
iteration: 26; x: 0.884906 + 0.000000 i; y: -1.006123 + 0.000000 i; f: 1.031654, g: 0.208049
iteration: 27; x: 2.939845 + 0.000000 i; y: -0.450892 + 0.000000 i; f: 3.417195, g: 1.363976
iteration: 28; x: 2.070070 + 0.000000 i; y: -0.356109 + 0.000000 i; f: 0.627972, g: 0.198111
iteration: 29; x: 1.744106 + 0.000000 i; y: -0.551657 + 0.000000 i; f: 0.409677, g: 0.064802
iteration: 30; x: 1.385542 + 0.000000 i; y: -0.776330 + 0.000000 i; f: 0.527661, g: 0.082620
iteration: 31; x: 0.240374 + 0.000000 i; y: -1.234073 + 0.000000 i; f: 2.334041, g: 0.537381
iteration: 32; x: 1.548099 + 0.000000 i; y: -0.952666 + 0.000000 i; f: 1.160652, g: 0.506726
iteration: 33; x: 0.268739 + 0.000000 i; y: -1.206461 + 0.000000 i; f: 2.196752, g: 0.473603
iteration: 34; x: 1.549997 + 0.000000 i; y: -0.938833 + 0.000000 i; f: 1.122737, g: 0.482030
iteration: 35; x: 0.312482 + 0.000000 i; y: -1.192894 + 0.000000 i; f: 2.088572, g: 0.447408
iteration: 36; x: 1.595804 + 0.000000 i; y: -0.921321 + 0.000000 i; f: 1.125137, g: 0.485481
iteration: 37; x: 0.482590 + 0.000000 i; y: -1.139896 + 0.000000 i; f: 1.706972, g: 0.357586
iteration: 38; x: 1.805153 + 0.000000 i; y: -0.843065 + 0.000000 i; f: 1.202094, g: 0.525402
iteration: 39; x: 0.994646 + 0.000000 i; y: -0.965322 + 0.000000 i; f: 0.897199, g: 0.179178
iteration: 40; x: 4.108385 + 0.000000 i; y: -0.070434 + 0.000000 i; f: 8.737451, g: 3.224667
iteration: 41; x: 2.735443 + 0.000000 i; y: 2.800192 + 0.000000 i; f: 7.052646, g: 8.711737
iteration: 42; x: 1.767825 + 0.000000 i; y: 1.480942 + 0.000000 i; f: 0.301803, g: 1.974491
iteration: 43; x: 2.394548 + 0.000000 i; y: 0.627276 + 0.000000 i; f: 0.710963, g: 0.826941
iteration: 44; x: 2.258735 + 0.000000 i; y: 0.097737 + 0.000000 i; f: 0.496229, g: 0.285023
iteration: 45; x: 2.077600 + 0.000000 i; y: -0.313856 + 0.000000 i; f: 0.573583, g: 0.177611
iteration: 46; x: 1.781245 + 0.000000 i; y: -0.521344 + 0.000000 i; f: 0.403487, g: 0.065008
iteration: 47; x: 1.449174 + 0.000000 i; y: -0.742640 + 0.000000 i; f: 0.495910, g: 0.076540
iteration: 48; x: 0.595453 + 0.000000 i; y: -1.107591 + 0.000000 i; f: 1.498009, g: 0.315400
iteration: 49; x: 1.994584 + 0.000000 i; y: -0.777164 + 0.000000 i; f: 1.370344, g: 0.598575
iteration: 50; x: 1.276005 + 0.000000 i; y: -0.853118 + 0.000000 i; f: 0.657107, g: 0.134858
iteration: 51; x: -1.254699 + 0.000000 i; y: -1.720371 + 0.000000 i; f: 8.763717, g: 2.353245
iteration: 52; x: 0.553593 + 0.000000 i; y: -1.366142 + 0.000000 i; f: 2.431763, g: 0.942959
iteration: 53; x: 2.454544 + 0.000000 i; y: -0.828446 + 0.000000 i; f: 2.630468, g: 1.192520
iteration: 54; x: 1.568354 + 0.000000 i; y: -0.765121 + 0.000000 i; f: 0.673557, g: 0.200344
iteration: 55; x: 0.798314 + 0.000000 i; y: -1.028807 + 0.000000 i; f: 1.127928, g: 0.217770
iteration: 56; x: 2.488410 + 0.000000 i; y: -0.595108 + 0.000000 i; f: 2.164627, g: 0.902200
iteration: 57; x: 1.760711 + 0.000000 i; y: -0.597803 + 0.000000 i; f: 0.533852, g: 0.132394
iteration: 58; x: 1.328195 + 0.000000 i; y: -0.805542 + 0.000000 i; f: 0.562151, g: 0.089923
iteration: 59; x: -0.266394 + 0.000000 i; y: -1.407025 + 0.000000 i; f: 3.990496, g: 0.997460
iteration: 60; x: 1.149461 + 0.000000 i; y: -1.119584 + 0.000000 i; f: 1.395391, g: 0.583783
iteration: 61; x: -94.334239 + 0.000000 i; y: -25.366813 + 0.000000 i; f: 9756.459210, g: 2867.212372
iteration: 62; x: -44.522125 + 0.000000 i; y: -15.162172 + 0.000000 i; f: 2316.317536, g: 724.446370
iteration: 63; x: -20.069574 + 0.000000 i; y: -9.222832 + 0.000000 i; f: 537.210405, g: 184.757578
iteration: 64; x: -8.086530 + 0.000000 i; y: -5.725518 + 0.000000 i; f: 120.072095, g: 48.129543
iteration: 65; x: -2.142329 + 0.000000 i; y: -3.621292 + 0.000000 i; f: 25.609278, g: 13.261147
iteration: 66; x: 1.158845 + 0.000000 i; y: -2.278532 + 0.000000 i; f: 6.495474, g: 4.527441
iteration: 67; x: -150.086766 + 0.000000 i; y: -20.515643 + 0.000000 i; f: 23267.618070, g: 6051.400921
iteration: 68; x: -73.601684 + 0.000000 i; y: -12.918960 + 0.000000 i; f: 5744.229789, g: 1520.201514
iteration: 69; x: -35.497581 + 0.000000 i; y: -8.354412 + 0.000000 i; f: 1409.224032, g: 383.815769
iteration: 70; x: -16.512840 + 0.000000 i; y: -5.549932 + 0.000000 i; f: 342.051233, g: 97.970211
iteration: 71; x: -7.027723 + 0.000000 i; y: -3.779000 + 0.000000 i; f: 81.504170, g: 25.628062
iteration: 72; x: -2.223717 + 0.000000 i; y: -2.621623 + 0.000000 i; f: 18.886884, g: 7.109138
iteration: 73; x: 0.378727 + 0.000000 i; y: -1.817620 + 0.000000 i; f: 4.507342, g: 2.339601
iteration: 74; x: 2.874594 + 0.000000 i; y: -1.044018 + 0.000000 i; f: 4.648096, g: 2.155797
iteration: 75; x: 1.696521 + 0.000000 i; y: -0.822491 + 0.000000 i; f: 0.984125, g: 0.396038
iteration: 76; x: 0.885192 + 0.000000 i; y: -1.000110 + 0.000000 i; f: 1.013512, g: 0.196112
iteration: 77; x: 2.915417 + 0.000000 i; y: -0.452830 + 0.000000 i; f: 3.326707, g: 1.329969
iteration: 78; x: 2.057345 + 0.000000 i; y: -0.365435 + 0.000000 i; f: 0.616956, g: 0.191710
iteration: 79; x: 1.731728 + 0.000000 i; y: -0.561424 + 0.000000 i; f: 0.412048, g: 0.064918
iteration: 80; x: 1.363383 + 0.000000 i; y: -0.787652 + 0.000000 i; f: 0.540094, g: 0.085098
iteration: 81; x: 0.074139 + 0.000000 i; y: -1.291534 + 0.000000 i; f: 2.816814, g: 0.669435
iteration: 82; x: 1.401281 + 0.000000 i; y: -1.013326 + 0.000000 i; f: 1.201182, g: 0.517726
iteration: 83; x: -0.682379 + 0.000000 i; y: -1.478216 + 0.000000 i; f: 5.493739, g: 1.301533

iteration: 84; x: 0.833815 + 0.000000 i; y: -1.212956 + 0.000000 i; f: 1.711836, g: 0.645074
iteration: 85; x: 3.402669 + 0.000000 i; y: -0.505573 + 0.000000 i; f: 5.533997, g: 2.150144
iteration: 86; x: 2.275161 + 0.000000 i; y: -0.276255 + 0.000000 i; f: 0.978606, g: 0.370406
iteration: 87; x: 1.874762 + 0.000000 i; y: -0.430244 + 0.000000 i; f: 0.380561, g: 0.063793
iteration: 88; x: 1.602544 + 0.000000 i; y: -0.652651 + 0.000000 i; f: 0.441665, g: 0.067991
iteration: 89; x: 1.095778 + 0.000000 i; y: -0.911646 + 0.000000 i; f: 0.751919, g: 0.131281
iteration: 90; x: 9.425499 + 0.000000 i; y: 1.663388 + 0.000000 i; f: 71.092504, g: 23.976868
iteration: 91; x: 5.347844 + 0.000000 i; y: 0.232603 + 0.000000 i; f: 17.725249, g: 6.203963
iteration: 92; x: 3.360643 + 0.000000 i; y: -1.681266 + 0.000000 i; f: 9.080557, g: 4.650135
iteration: 93; x: 1.620043 + 0.000000 i; y: -1.168150 + 0.000000 i; f: 1.917178, g: 1.020710
iteration: 94; x: -0.064624 + 0.000000 i; y: -1.315352 + 0.000000 i; f: 3.178925, g: 0.731194
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iteration: 96; x: -3.250908 + 0.000000 i; y: -2.168727 + 0.000000 i; f: 23.942327, g: 6.345480
iteration: 97; x: -0.549732 + 0.000000 i; y: -1.718039 + 0.000000 i; f: 6.071365, g: 2.027209
iteration: 98; x: 1.157800 + 0.000000 i; y: -1.264654 + 0.000000 i; f: 1.888903, g: 0.934474
iteration: 99; x: -53.209325 + 0.000000 i; y: -13.338570 + 0.000000 i; f: 3128.906935, g: 884.725507
iteration: 100; x: -24.964496 + 0.000000 i; y: -8.342481 + 0.000000 i; f: 751.094512, g: 224.403498
iteration: 101; x: -10.980636 + 0.000000 i; y: -5.354551 + 0.000000 i; f: 176.561400, g: 57.814809
iteration: 102; x: -4.021114 + 0.000000 i; y: -3.523882 + 0.000000 i; f: 40.153212, g: 15.460085
iteration: 103; x: -0.433269 + 0.000000 i; y: -2.353792 + 0.000000 i; f: 8.948390, g: 4.587268
iteration: 104; x: 1.979430 + 0.000000 i; y: -1.490378 + 0.000000 i; f: 3.670887, g: 2.200762
iteration: 105; x: 0.223621 + 0.000000 i; y: -1.335044 + 0.000000 i; f: 2.720151, g: 0.794844
iteration: 106; x: 1.667509 + 0.000000 i; y: -0.976896 + 0.000000 i; f: 1.376791, g: 0.649473
iteration: 107; x: 0.521656 + 0.000000 i; y: -1.133457 + 0.000000 i; f: 1.646995, g: 0.352756
iteration: 108; x: 1.874442 + 0.000000 i; y: -0.822197 + 0.000000 i; f: 1.262853, g: 0.554391
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iteration: 110; x: 11.684429 + 0.000000 i; y: 2.324284 + 0.000000 i; f: 116.235041, g: 38.533766
iteration: 111; x: 6.428062 + 0.000000 i; y: 0.640982 + 0.000000 i; f: 28.233733, g: 9.740853
iteration: 112; x: 3.902056 + 0.000000 i; y: -0.624413 + 0.000000 i; f: 8.436231, g: 3.196401
iteration: 113; x: 2.485903 + 0.000000 i; y: -0.277328 + 0.000000 i; f: 1.562147, g: 0.621840
iteration: 114; x: 1.953541 + 0.000000 i; y: -0.349195 + 0.000000 i; f: 0.380371, g: 0.076017
iteration: 115; x: 1.712219 + 0.000000 i; y: -0.577862 + 0.000000 i; f: 0.419043, g: 0.066848
iteration: 116; x: 1.325200 + 0.000000 i; y: -0.806708 + 0.000000 i; f: 0.563240, g: 0.089816
iteration: 117; x: -0.299156 + 0.000000 i; y: -1.418132 + 0.000000 i; f: 4.117038, g: 1.033473
iteration: 118; x: 1.127541 + 0.000000 i; y: -1.128995 + 0.000000 i; f: 1.419891, g: 0.592466
iteration: 119; x: 43.049402 + 0.000000 i; y: 9.600359 + 0.000000 i; f: 1849.717869, g: 554.479655
iteration: 120; x: 21.607420 + 0.000000 i; y: 4.759530 + 0.000000 i; f: 441.559358, g: 138.373277
iteration: 121; x: 11.209719 + 0.000000 i; y: 2.024015 + 0.000000 i; f: 105.310982, g: 34.511088
iteration: 122; x: 6.211399 + 0.000000 i; y: 0.419233 + 0.000000 i; f: 25.915204, g: 8.821126
iteration: 123; x: 3.786961 + 0.000000 i; y: -1.121139 + 0.000000 i; f: 9.145242, g: 3.842220
iteration: 124; x: 2.225723 + 0.000000 i; y: -0.725984 + 0.000000 i; f: 1.755433, g: 0.765513
iteration: 125; x: 1.501361 + 0.000000 i; y: -0.753947 + 0.000000 i; f: 0.573745, g: 0.131957
iteration: 126; x: 0.692019 + 0.000000 i; y: -1.069354 + 0.000000 i; f: 1.307725, g: 0.263241
iteration: 127; x: 2.182707 + 0.000000 i; y: -0.705100 + 0.000000 i; f: 1.601063, g: 0.688219
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iteration: 129; x: 0.677032 + 0.000000 i; y: -1.075255 + 0.000000 i; f: 1.335736, g: 0.270766
iteration: 130; x: 2.149508 + 0.000000 i; y: -0.717562 + 0.000000 i; f: 1.553825, g: 0.669991
iteration: 131; x: 1.457635 + 0.000000 i; y: -0.768848 + 0.000000 i; f: 0.569405, g: 0.122302
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iteration: 133; x: 1.890264 + 0.000000 i; y: -0.814469 + 0.000000 i; f: 1.270398, g: 0.556634
iteration: 134; x: 1.131771 + 0.000000 i; y: -0.912841 + 0.000000 i; f: 0.763484, g: 0.153505
iteration: 135; x: 36.527703 + 0.000000 i; y: 10.142500 + 0.000000 i; f: 1353.945489, g: 435.438583
iteration: 136; x: 18.178828 + 0.000000 i; y: 5.197100 + 0.000000 i; f: 315.924875, g: 108.627291
iteration: 137; x: 9.403741 + 0.000000 i; y: 2.419888 + 0.000000 i; f: 73.058827, g: 26.963443
iteration: 138; x: 5.282625 + 0.000000 i; y: 0.852359 + 0.000000 i; f: 17.215030, g: 6.703047
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iteration: 143; x: 1.867292 + 0.000000 i; y: -0.441773 + 0.000000 i; f: 0.389131, g: 0.066858
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iteration: 145; x: 1.056785 + 0.000000 i; y: -0.928202 + 0.000000 i; f: 0.792986, g: 0.140758

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iteration: 152; x: 1.514410 + 0.000000 i; y: -0.966474 + 0.000000 i; f: 1.165163, g: 0.507431
iteration: 153; x: 0.112652 + 0.000000 i; y: -1.253076 + 0.000000 i; f: 2.610662, g: 0.573372
iteration: 154; x: 1.401702 + 0.000000 i; y: -0.995319 + 0.000000 i; f: 1.147343, g: 0.481852
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iteration: 156; x: 0.887573 + 0.000000 i; y: -1.193895 + 0.000000 i; f: 1.631920, g: 0.622332
iteration: 157; x: 3.843953 + 0.000000 i; y: -0.383801 + 0.000000 i; f: 7.619176, g: 2.841298
iteration: 158; x: 2.532628 + 0.000000 i; y: 0.034334 + 0.000000 i; f: 1.315795, g: 0.604730
iteration: 159; x: 2.115939 + 0.000000 i; y: -1.088039 + 0.000000 i; f: 2.517188, g: 1.303128
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iteration: 161; x: 5.285530 + 0.000000 i; y: 0.191897 + 0.000000 i; f: 17.210696, g: 6.021031
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iteration: 184; x: 1.738201 + 0.000000 i; y: -0.556345 + 0.000000 i; f: 0.410804, g: 0.064855
iteration: 185; x: 1.375023 + 0.000000 i; y: -0.781729 + 0.000000 i; f: 0.533472, g: 0.083773
iteration: 186; x: 0.165088 + 0.000000 i; y: -1.260202 + 0.000000 i; f: 2.545387, g: 0.594922
iteration: 187; x: 1.478824 + 0.000000 i; y: -0.981134 + 0.000000 i; f: 1.173030, g: 0.509354
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iteration: 189; x: 1.240870 + 0.000000 i; y: -1.057058 + 0.000000 i; f: 1.232448, g: 0.502311
iteration: 190; x: -4.480197 + 0.000000 i; y: -2.498436 + 0.000000 i; f: 37.773175, g: 10.260222
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iteration: 207; x: 2.228298 + 0.000000 i; y: -0.164965 + 0.000000 i; f: 0.700894, g: 0.268541

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iteration: 241; x: -2.136700 + 0.000000 i; y: -2.002287 + 0.000000 i; f: 14.850326, g: 4.150525
iteration: 242; x: 0.089222 + 0.000000 i; y: -1.559678 + 0.000000 i; f: 3.821789, g: 1.434585
iteration: 243; x: 1.772914 + 0.000000 i; y: -1.075701 + 0.000000 i; f: 1.830230, g: 0.942939
iteration: 244; x: 0.540590 + 0.000000 i; y: -1.145174 + 0.000000 i; f: 1.667653, g: 0.384482
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iteration: 247; x: -7.838151 + 0.000000 i; y: -3.798064 + 0.000000 i; f: 95.336266, g: 28.784443
iteration: 248; x: -2.687978 + 0.000000 i; y: -2.665839 + 0.000000 i; f: 22.373720, g: 7.913003
iteration: 249; x: 0.059235 + 0.000000 i; y: -1.874197 + 0.000000 i; f: 5.271850, g: 2.513492
iteration: 250; x: 2.176529 + 0.000000 i; y: -1.186916 + 0.000000 i; f: 2.979905, g: 1.593089
iteration: 251; x: 0.969536 + 0.000000 i; y: -1.069148 + 0.000000 i; f: 1.213154, g: 0.378077
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iteration: 253; x: 2.835030 + 0.000000 i; y: 1.665125 + 0.000000 i; f: 3.474850, g: 3.781990
iteration: 254; x: 2.300179 + 0.000000 i; y: 0.757136 + 0.000000 i; f: 0.506583, g: 0.895960
iteration: 255; x: 2.271243 + 0.000000 i; y: 0.187435 + 0.000000 i; f: 0.463756, g: 0.324768
iteration: 256; x: 2.118625 + 0.000000 i; y: -0.216575 + 0.000000 i; f: 0.514802, g: 0.169048
iteration: 257; x: 1.866646 + 0.000000 i; y: -0.442541 + 0.000000 i; f: 0.389457, g: 0.066934
iteration: 258; x: 1.585592 + 0.000000 i; y: -0.663289 + 0.000000 i; f: 0.446159, g: 0.068477
iteration: 259; x: 1.053936 + 0.000000 i; y: -0.929400 + 0.000000 i; f: 0.796093, g: 0.141480
iteration: 260; x: 5.715255 + 0.000000 i; y: 0.468193 + 0.000000 i; f: 20.984638, g: 7.385239
iteration: 261; x: 3.554210 + 0.000000 i; y: -0.823773 + 0.000000 i; f: 7.026365, g: 2.836704
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iteration: 266; x: -0.950950 + 0.000000 i; y: -2.001176 + 0.000000 i; f: 8.812088, g: 3.230782
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iteration: 269; x: 5.153088 + 0.000000 i; y: -1.904059 + 0.000000 i; f: 21.777636, g: 9.264018

iteration: 270; x: 2.709961 + 0.000000 i; y: -1.124357 + 0.000000 i; f: 4.312503, g: 2.100151
iteration: 271; x: 1.520350 + 0.000000 i; y: -0.907232 + 0.000000 i; f: 1.001067, g: 0.400937
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iteration: 281; x: 1.550447 + 0.000000 i; y: -0.684810 + 0.000000 i; f: 0.456766, g: 0.069936
iteration: 282; x: 0.959099 + 0.000000 i; y: -0.968459 + 0.000000 i; f: 0.908044, g: 0.167880
iteration: 283; x: 3.521791 + 0.000000 i; y: -0.247304 + 0.000000 i; f: 5.667891, g: 2.161911
iteration: 284; x: 2.419992 + 0.000000 i; y: 0.201049 + 0.000000 i; f: 0.855748, g: 0.504511
iteration: 285; x: 2.149971 + 0.000000 i; y: -0.241098 + 0.000000 i; f: 0.621659, g: 0.213722
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iteration: 289; x: 4.698977 + 0.000000 i; y: 0.138624 + 0.000000 i; f: 12.563026, g: 4.539313
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iteration: 293; x: 3.429037 + 0.000000 i; y: 0.793081 + 0.000000 i; f: 4.736116, g: 2.568551
iteration: 294; x: 2.566252 + 0.000000 i; y: 0.106335 + 0.000000 i; f: 1.358118, g: 0.657720
iteration: 295; x: 2.153052 + 0.000000 i; y: -0.493334 + 0.000000 i; f: 1.066241, g: 0.402286
iteration: 296; x: 1.663699 + 0.000000 i; y: -0.619531 + 0.000000 i; f: 0.443846, g: 0.075792
iteration: 297; x: 1.218321 + 0.000000 i; y: -0.857368 + 0.000000 i; f: 0.640113, g: 0.106157
iteration: 298; x: -3.226832 + 0.000000 i; y: -2.374601 + 0.000000 i; f: 24.879436, g: 7.241840
iteration: 299; x: -0.446834 + 0.000000 i; y: -1.794177 + 0.000000 i; f: 6.106579, g: 2.268988
iteration: 300; x: 1.340426 + 0.000000 i; y: -1.273135 + 0.000000 i; f: 2.009899, g: 1.070059
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iteration: 303; x: 1.191344 + 0.000000 i; y: -1.212751 + 0.000000 i; f: 1.720128, g: 0.825590
iteration: 304; x: -14.215919 + 0.000000 i; y: -4.656196 + 0.000000 i; f: 256.860542, g: 71.203251
iteration: 305; x: -5.983904 + 0.000000 i; y: -3.293450 + 0.000000 i; f: 61.915182, g: 18.798593
iteration: 306; x: -1.773145 + 0.000000 i; y: -2.352158 + 0.000000 i; f: 14.575134, g: 5.318656
iteration: 307; x: 0.561913 + 0.000000 i; y: -1.661630 + 0.000000 i; f: 3.614565, g: 1.839952
iteration: 308; x: 3.212367 + 0.000000 i; y: -0.883896 + 0.000000 i; f: 5.559736, g: 2.361098
iteration: 309; x: 2.003196 + 0.000000 i; y: -0.646908 + 0.000000 i; f: 1.071798, g: 0.421687
iteration: 310; x: 1.431358 + 0.000000 i; y: -0.763666 + 0.000000 i; f: 0.532921, g: 0.095382
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iteration: 312; x: 1.802084 + 0.000000 i; y: -0.849998 + 0.000000 i; f: 1.215835, g: 0.534374
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iteration: 315; x: 2.605952 + 0.000000 i; y: 0.933371 + 0.000000 i; f: 1.516891, g: 1.568927
iteration: 316; x: 2.319894 + 0.000000 i; y: 0.292575 + 0.000000 i; f: 0.535144, g: 0.431077
iteration: 317; x: 2.164731 + 0.000000 i; y: -0.136540 + 0.000000 i; f: 0.511781, g: 0.190158
iteration: 318; x: 1.931713 + 0.000000 i; y: -0.363774 + 0.000000 i; f: 0.364193, g: 0.065210
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iteration: 320; x: 1.285967 + 0.000000 i; y: -0.825744 + 0.000000 i; f: 0.589373, g: 0.095280
iteration: 321; x: -0.877141 + 0.000000 i; y: -1.610226 + 0.000000 i; f: 6.726710, g: 1.785171
iteration: 322; x: 0.773250 + 0.000000 i; y: -1.280658 + 0.000000 i; f: 1.972157, g: 0.789562
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iteration: 330; x: -29.429830 + 0.000000 i; y: -10.595026 + 0.000000 i; f: 1047.824182, g: 327.783304
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iteration: 332; x: -4.755028 + 0.000000 i; y: -4.206284 + 0.000000 i; f: 54.019455, g: 22.345399
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iteration: 353; x: -8.930877 + 0.000000 i; y: -5.160106 + 0.000000 i; f: 129.409123, g: 45.566839
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iteration: 363; x: -2.657672 + 0.000000 i; y: -2.275730 + 0.000000 i; f: 19.833243, g: 5.944753
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iteration: 405; x: 2.189073 + 0.000000 i; y: -0.926949 + 0.000000 i; f: 2.200080, g: 1.057246
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iteration: 410; x: 1.137670 + 0.000000 i; y: -0.944587 + 0.000000 i; f: 0.855784, g: 0.215817
iteration: 411; x: 83.518836 + 0.000000 i; y: 23.974825 + 0.000000 i; f: 7359.175703, g: 2317.641237
iteration: 412; x: 40.507996 + 0.000000 i; y: 13.098133 + 0.000000 i; f: 1718.344693, g: 580.785524
iteration: 413; x: 19.779693 + 0.000000 i; y: 6.953956 + 0.000000 i; f: 393.080395, g: 145.166557
iteration: 414; x: 9.952852 + 0.000000 i; y: 3.504076 + 0.000000 i; f: 87.928034, g: 36.043366
iteration: 415; x: 5.418629 + 0.000000 i; y: 1.580725 + 0.000000 i; f: 19.442245, g: 8.839075
iteration: 416; x: 3.410943 + 0.000000 i; y: 0.505388 + 0.000000 i; f: 4.562676, g: 2.164050
iteration: 417; x: 2.534017 + 0.000000 i; y: -0.155964 + 0.000000 i; f: 1.533497, g: 0.629635
iteration: 418; x: 2.033436 + 0.000000 i; y: -0.170726 + 0.000000 i; f: 0.267864, g: 0.062863
iteration: 419; x: 1.881732 + 0.000000 i; y: -0.438339 + 0.000000 i; f: 0.407931, g: 0.077370
iteration: 420; x: 1.596166 + 0.000000 i; y: -0.656560 + 0.000000 i; f: 0.443045, g: 0.068008
iteration: 421; x: 1.080540 + 0.000000 i; y: -0.918154 + 0.000000 i; f: 0.767649, g: 0.134899
iteration: 422; x: 7.501147 + 0.000000 i; y: 1.044348 + 0.000000 i; f: 41.311229, g: 14.157465
iteration: 423; x: 4.424624 + 0.000000 i; y: -0.209419 + 0.000000 i; f: 10.981324, g: 3.938181
iteration: 424; x: 2.855394 + 0.000000 i; y: 0.904505 + 0.000000 i; f: 2.356110, g: 1.856448
iteration: 425; x: 2.378945 + 0.000000 i; y: 0.254302 + 0.000000 i; f: 0.711858, g: 0.479515
iteration: 426; x: 2.160699 + 0.000000 i; y: -0.178091 + 0.000000 i; f: 0.557030, g: 0.198872
iteration: 427; x: 1.903800 + 0.000000 i; y: -0.398958 + 0.000000 i; f: 0.374981, g: 0.065281
iteration: 428; x: 1.646721 + 0.000000 i; y: -0.623834 + 0.000000 i; f: 0.431252, g: 0.067092
iteration: 429; x: 1.195686 + 0.000000 i; y: -0.867707 + 0.000000 i; f: 0.658917, g: 0.110332
iteration: 430; x: -5.334856 + 0.000000 i; y: -3.053874 + 0.000000 i; f: 51.510417, g: 15.441318
iteration: 431; x: -1.471962 + 0.000000 i; y: -2.212758 + 0.000000 i; f: 12.219648, g: 4.437964
iteration: 432; x: 0.713531 + 0.000000 i; y: -1.573401 + 0.000000 i; f: 3.131055, g: 1.602872
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iteration: 437; x: 0.965720 + 0.000000 i; y: -0.965783 + 0.000000 i; f: 0.899695, g: 0.165890
iteration: 438; x: 3.600475 + 0.000000 i; y: -0.221253 + 0.000000 i; f: 6.032677, g: 2.289808
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iteration: 442; x: 1.720657 + 0.000000 i; y: -0.572150 + 0.000000 i; f: 0.418851, g: 0.067520
iteration: 443; x: 1.339812 + 0.000000 i; y: -0.799478 + 0.000000 i; f: 0.554115, g: 0.087939
iteration: 444; x: -0.140284 + 0.000000 i; y: -1.364588 + 0.000000 i; f: 3.526936, g: 0.867020
iteration: 445; x: 1.237329 + 0.000000 i; y: -1.082308 + 0.000000 i; f: 1.310024, g: 0.554136
iteration: 446; x: -5.010677 + 0.000000 i; y: -2.612040 + 0.000000 i; f: 44.563037, g: 12.099476
iteration: 447; x: -1.434261 + 0.000000 i; y: -2.011103 + 0.000000 i; f: 10.981268, g: 3.558813
iteration: 448; x: 0.606082 + 0.000000 i; y: -1.490091 + 0.000000 i; f: 2.865633, g: 1.312204
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iteration: 453; x: 1.362920 + 0.000000 i; y: -1.028476 + 0.000000 i; f: 1.217949, g: 0.522150
iteration: 454; x: -1.121763 + 0.000000 i; y: -1.597794 + 0.000000 i; f: 7.652618, g: 1.867535
iteration: 455; x: 0.573596 + 0.000000 i; y: -1.310949 + 0.000000 i; f: 2.211357, g: 0.800841

iteration: 456; x: 2.391429 + 0.000000 i; y: -0.806661 + 0.000000 i; f: 2.393437, g: 1.080435
iteration: 457; x: 1.543273 + 0.000000 i; y: -0.765576 + 0.000000 i; f: 0.646829, g: 0.181530
iteration: 458; x: 0.749722 + 0.000000 i; y: -1.046935 + 0.000000 i; f: 1.205647, g: 0.236594
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iteration: 460; x: 1.630638 + 0.000000 i; y: -0.676962 + 0.000000 i; f: 0.532944, g: 0.123022
iteration: 461; x: 1.078362 + 0.000000 i; y: -0.918673 + 0.000000 i; f: 0.768774, g: 0.134677
iteration: 462; x: 7.293098 + 0.000000 i; y: 0.978380 + 0.000000 i; f: 38.581926, g: 13.254546
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iteration: 464; x: 2.795631 + 0.000000 i; y: 0.573148 + 0.000000 i; f: 1.979643, g: 1.282387
iteration: 465; x: 2.332877 + 0.000000 i; y: 0.018717 + 0.000000 i; f: 0.758196, g: 0.360929
iteration: 466; x: 2.055460 + 0.000000 i; y: -0.978781 + 0.000000 i; f: 2.050790, g: 1.014242
iteration: 467; x: 1.088888 + 0.000000 i; y: -0.968122 + 0.000000 i; f: 0.913282, g: 0.233679
iteration: 468; x: 9.521693 + 0.000000 i; y: 1.523749 + 0.000000 i; f: 72.417308, g: 23.987470
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iteration: 472; x: 1.491111 + 0.000000 i; y: -1.841085 + 0.000000 i; f: 4.471869, g: 2.945447
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iteration: 487; x: -4.679686 + 0.000000 i; y: -3.584967 + 0.000000 i; f: 47.695782, g: 17.326851
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iteration: 490; x: -2.242987 + 0.000000 i; y: -1.813371 + 0.000000 i; f: 14.618649, g: 3.546061
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iteration: 492; x: 1.470983 + 0.000000 i; y: -1.103798 + 0.000000 i; f: 1.543992, g: 0.759317
iteration: 493; x: -0.556692 + 0.000000 i; y: -1.435390 + 0.000000 i; f: 4.919024, g: 1.137820
iteration: 494; x: 0.905919 + 0.000000 i; y: -1.180857 + 0.000000 i; f: 1.584131, g: 0.599595
iteration: 495; x: 4.003368 + 0.000000 i; y: -0.332907 + 0.000000 i; f: 8.463951, g: 3.117565
iteration: 496; x: 2.623960 + 0.000000 i; y: 0.202417 + 0.000000 i; f: 1.475801, g: 0.762264
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iteration: 500; x: 0.871707 + 0.000000 i; y: -1.003228 + 0.000000 i; f: 1.026154, g: 0.196435
iteration: 501; x: 2.827267 + 0.000000 i; y: -0.480529 + 0.000000 i; f: 3.050342, g: 1.229268
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iteration: 505; x: -2.370708 + 0.000000 i; y: -2.097572 + 0.000000 i; f: 16.859050, g: 4.804872
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iteration: 516; x: -0.597860 + 0.000000 i; y: -1.457345 + 0.000000 i; f: 5.134356, g: 1.213213
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iteration: 518; x: 3.852669 + 0.000000 i; y: -0.381383 + 0.000000 i; f: 7.664554, g: 2.856217
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iteration: 562; x: 1.741355 + 0.000000 i; y: -0.866705 + 0.000000 i; f: 1.167490, g: 0.509257
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iteration: 566; x: 1.671657 + 0.000000 i; y: -0.605998 + 0.000000 i; f: 0.424355, g: 0.065843
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iteration: 568; x: -1.807791 + 0.000000 i; y: -1.914767 + 0.000000 i; f: 12.464791, g: 3.483360
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iteration: 571; x: 0.995282 + 0.000000 i; y: -1.000905 + 0.000000 i; f: 1.002737, g: 0.249457
iteration: 572; x: 4.395045 + 0.000000 i; y: -0.031122 + 0.000000 i; f: 10.558425, g: 3.830075
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iteration: 577; x: 0.075977 + 0.000000 i; y: 1.131830 + 0.000000 i; f: 0.003028, g: 0.282483
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iteration: 579; x: 0.000016 + 0.000000 i; y: 1.000034 + 0.000000 i; f: 0.000003, g: 0.000069

```
iteration: 580; x: 0.000000 + 0.000000 i; y: 1.000000 + 0.000000 i; f: 0.000000, g: 0.000000
```

```
xm =
```

```
1.6667 + 0.8819i  
0.0000 + 0.0000i  
1.6667 - 0.8819i  
0.0000 + 0.0000i
```

```
ym =
```

```
-0.8333 + 0.4410i  
1.0000 + 0.0000i  
-0.8333 - 0.4410i  
1.0000 + 0.0000i
```

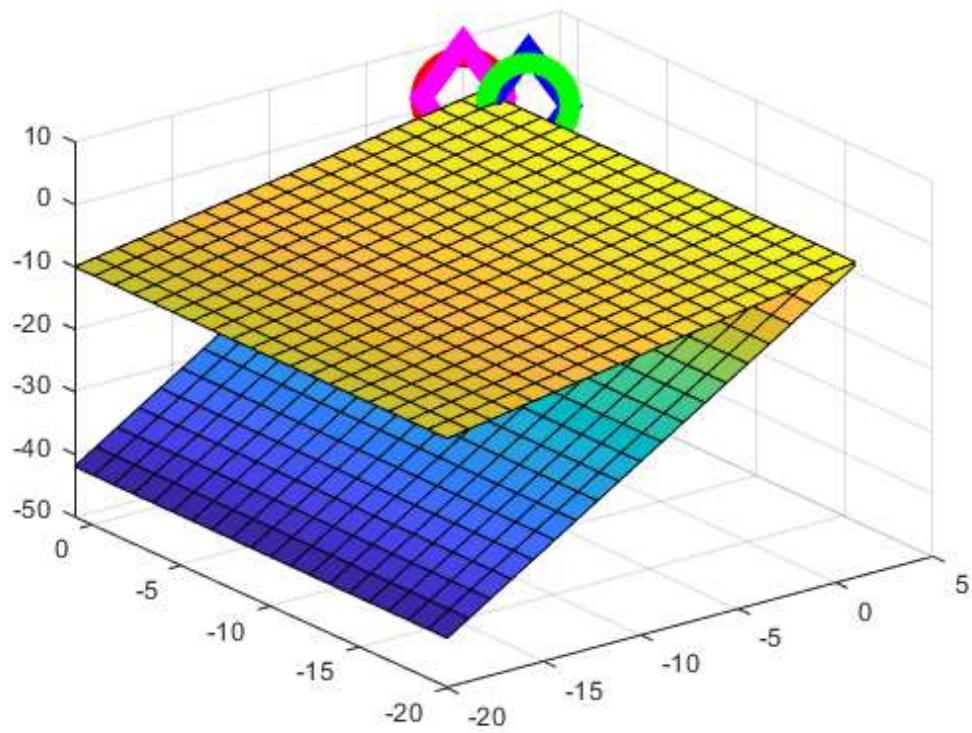
```
it2D =
```

```
31  
4  
28  
580
```

```
success2D =
```

```
4x1 logical array
```

```
1  
1  
1  
1
```



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