Justin Nguyen

Abstract 99A

max error in W is
9.8156e-05

h = 0.02

```
x_t_w_y_error =

        1.02        16.727        16.727        8.81e-06
        1.04        16.466        16.466      1.6963e-05

        1.06        16.218        16.218      2.4509e-05
        1.08        15.981        15.981      3.1489e-05
         1.1        15.755        15.755      3.7945e-05
        1.12         15.54         15.54      4.3913e-05
        1.14        15.335        15.335      4.9425e-05
        1.16        15.139        15.139      5.4513e-05
        1.18        14.952        14.952      5.9204e-05
         1.2        14.773        14.773      6.3524e-05
        1.22        14.603        14.603      6.7496e-05
        1.24        14.441        14.441      7.1143e-05
```

1.24	14.441	14.441	7.1142e-05
1.26	14.286	14.286	7.4482e-05
1.28	14.138	14.138	7.7534e-05
1.3	13.998	13.998	8.0316e-05
1.32	13.864	13.864	8.2843e-05
1.34	13.736	13.736	8.513e-05
1.36	13.614	13.614	8.7191e-05
1.38	13.499	13.499	8.9038e-05
1.4	13.388	13.389	9.0683e-05
1.42	13.284	13.284	9.2137e-05
1.44	13.185	13.185	9.3411e-05
1.46	13.09	13.091	9.4514e-05
1.48	13.001	13.001	9.5455e-05
1.5	12.917	12.917	9.6242e-05
1.52	12.837	12.837	9.6884e-05
1.54	12.761	12.761	9.7388e-05
1.56	12.69	12.69	9.776e-05
1.58	12.623	12.623	9.8008e-05
1.6	12.56	12.56	9.8138e-05
1.62	12.501	12.501	9.8156e-05
1.64	12.446	12.446	9.8067e-05
1.66	12.394	12.394	9.7876e-05
1.68	12.346	12.346	9.7589e-05
1.7	12.302	12.302	9.7209e-05
1.72	12.261	12.261	9.6743e-05

1.72	12.261	12.261	9.6743e-05
1.74	12.223	12.223	9.6193e-05
1.76	12.188	12.189	9.5565e-05
1.78	12.157	12.157	9.4861e-05
1.8	12.129	12.129	9.4086e-05
1.82	12.104	12.104	9.3243e-05
1.84	12.081	12.081	9.2335e-05
1.86	12.062	12.062	9.1366e-05
1.88	12.045	12.045	9.0338e-05
1.9	12.031	12.031	8.9256e-05
1.92	12.02	12.02	8.8121e-05
1.94	12.011	12.011	8.6936e-05
1.96	12.005	12.005	8.5704e-05
1.98	12.001	12.001	8.4427e-05
2	12	12	8.3109e-05
2.02	12.001	12.001	8.175e-05
2.04	12.005	12.005	8.0354e-05
2.06	12.011	12.011	7.8922e-05
2.08	12.019	12.019	7.7457e-05
2.1	12.029	12.029	7.5961e-05
2.12	12.041	12.042	7.4436e-05
2.14	12.056	12.056	7.2883e-05
2.16	12.073	12.073	7.1305e-05
2.18	12.092	12.092	6.9702e-05
2.2	12.113	12.113	6.8078e-05

2.2	12.113	12.113	6.8078e-05
2.22	12.136	12.136	6.6433e-05
2.24	12.16	12.16	6.477e-05
2.26	12.187	12.187	6.309e-05
2.28	12.216	12.216	6.1393e-05
2.3	12.246	12.247	5.9683e-05
2.32	12.279	12.279	5.796e-05
2.34	12.313	12.313	5.6226e-05
2.36	12.349	12.349	5.4482e-05
2.38	12.387	12.387	5.273e-05
2.4	12.427	12.427	5.097e-05
2.42	12.468	12.468	4.9204e-05
2.44	12.511	12.511	4.7434e-05
2.46	12.556	12.556	4.566e-05
2.48	12.602	12.602	4.3883e-05
2.5	12.65	12.65	4.2106e-05
2.52	12.7	12.7	4.0328e-05
2.54	12.751	12.751	3.8551e-05
2.56	12.804	12.804	3.6777e-05
2.58	12.858	12.858	3.5005e-05
2.6	12.914	12.914	3.3237e-05
2.62	12.971	12.971	3.1474e-05
2.64	13.03	13.03	2.9717e-05
2.66	13.091	13.091	2.7967e-05
2.68	13.153	13.153	2.6225e-05

2.68	13.153	13.153	2.6225e-05
2.7	13.216	13.216	2.4491e-05
2.72	13.281	13.281	2.2766e-05
2.74	13.347	13.347	2.1052e-05
2.76	13.415	13.415	1.9348e-05
2.78	13.484	13.484	1.7656e-05
2.8	13.554	13.554	1.5977e-05
2.82	13.626	13.626	1.431e-05
2.84	13.699	13.699	1.2657e-05
2.86	13.774	13.774	1.1019e-05
2.88	13.85	13.85	9.395e-06
2.9	13.927	13.927	7.7871e-06
2.92	14.006	14.006	6.1953e-06
2.94	14.086	14.086	4.6201e-06
2.96	14.167	14.167	3.0622e-06
2.98	14.25	14.25	1.522e-06

Abstract 999

max error in W is
9.8165e-07

h = 0.002

x_t_w_y_error =

1.002	16.972	16.972	9.1283e-09
1.004	16.944	16.944	1.8186e-08
1.006	16.917	16.917	2.7174e-08
1.008	16.889	16.889	3.6093e-08
1.01	16.862	16.862	4.4943e-08
1.012	16.834	16.834	5.3725e-08
1.014	16.807	16.807	6.2439e-08
1.016	16.78	16.78	7.1086e-08
1.018	16.753	16.753	7.9666e-08
1.02	16.727	16.727	8.818e-08
1.022	16.7	16.7	9.6629e-08
1.024	16.674	16.674	1.0501e-07
1.026	16.647	16.647	1.1333e-07
1.028	16.621	16.621	1.2159e-07
1.03	16.595	16.595	1.2978e-07
1.032	16.569	16.569	1.379e-07
1.034	16.543	16.543	1.4597e-07
1.036	16.517	16.517	1.5397e-07
1.038	16.492	16.492	1.6191e-07
1.04	16.466	16.466	1.6979e-07

1.042	16.441	16.441	1.7761e-07
1.044	16.416	16.416	1.8537e-07
1.046	16.39	16.39	1.9307e-07
1.048	16.365	16.365	2.0071e-07
1.05	16.341	16.341	2.0829e-07
1.052	16.316	16.316	2.1581e-07
1.054	16.291	16.291	2.2327e-07
1.056	16.267	16.267	2.3068e-07
1.058	16.242	16.242	2.3803e-07
1.06	16.218	16.218	2.4532e-07
1.062	16.194	16.194	2.5255e-07
1.064	16.17	16.17	2.5973e-07
1.066	16.146	16.146	2.6685e-07
1.068	16.122	16.122	2.7392e-07
1.07	16.098	16.098	2.8093e-07
1.072	16.075	16.075	2.8789e-07
1.074	16.051	16.051	2.948e-07
1.076	16.028	16.028	3.0165e-07
1.078	16.004	16.004	3.0845e-07
1.08	15.981	15.981	3.1519e-07
1.082	15.958	15.958	3.2188e-07
1.084	15.935	15.935	3.2852e-07
1.086	15.912	15.912	3.3511e-07
1.088	15.89	15.89	3.4165e-07

1.09	15.867	15.867	3.4814e-07
1.092	15.844	15.844	3.5457e-07
1.094	15.822	15.822	3.6096e-07
1.096	15.8	15.8	3.6729e-07
1.098	15.778	15.778	3.7358e-07
1.1	15.755	15.755	3.7981e-07
1.102	15.733	15.733	3.86e-07
1.104	15.712	15.712	3.9214e-07
1.106	15.69	15.69	3.9823e-07
1.108	15.668	15.668	4.0428e-07
1.11	15.647	15.647	4.1027e-07
1.112	15.625	15.625	4.1622e-07
1.114	15.604	15.604	4.2212e-07
1.116	15.582	15.582	4.2798e-07
1.118	15.561	15.561	4.3379e-07
1.12	15.54	15.54	4.3955e-07
1.122	15.519	15.519	4.4527e-07
1.124	15.498	15.498	4.5094e-07
1.126	15.477	15.477	4.5657e-07
1.128	15.457	15.457	4.6215e-07
1.13	15.436	15.436	4.6769e-07
1.132	15.416	15.416	4.7318e-07
1.134	15.395	15.395	4.7863e-07
1.136	15.375	15.375	4.8404e-07

1.138	15.355	15.355	4.894e-07
1.14	15.335	15.335	4.9473e-07
1.142	15.315	15.315	5.0001e-07
1.144	15.295	15.295	5.0524e-07
1.146	15.275	15.275	5.1044e-07
1.148	15.255	15.255	5.1559e-07
1.15	15.236	15.236	5.207e-07
1.152	15.216	15.216	5.2577e-07
1.154	15.197	15.197	5.308e-07
1.156	15.177	15.177	5.3579e-07
1.158	15.158	15.158	5.4074e-07
1.16	15.139	15.139	5.4565e-07
1.162	15.12	15.12	5.5052e-07
1.164	15.101	15.101	5.5535e-07
1.166	15.082	15.082	5.6014e-07
1.168	15.063	15.063	5.6489e-07
1.17	15.044	15.044	5.6961e-07
1.172	15.025	15.025	5.7428e-07
1.174	15.007	15.007	5.7892e-07
1.176	14.988	14.988	5.8352e-07
1.178	14.97	14.97	5.8808e-07
1.18	14.952	14.952	5.926e-07
1.182	14.934	14.934	5.9709e-07
1.184	14.915	14.915	6.0154e-07

1.186	14.897	14.897	6.0595e-07
1.188	14.879	14.879	6.1033e-07
1.19	14.861	14.861	6.1467e-07
1.192	14.844	14.844	6.1897e-07
1.194	14.826	14.826	6.2324e-07
1.196	14.808	14.808	6.2748e-07
1.198	14.791	14.791	6.3167e-07
1.2	14.773	14.773	6.3584e-07
1.202	14.756	14.756	6.3996e-07
1.204	14.739	14.739	6.4406e-07
1.206	14.721	14.721	6.4812e-07
1.208	14.704	14.704	6.5214e-07
1.21	14.687	14.687	6.5613e-07
1.212	14.67	14.67	6.6009e-07
1.214	14.653	14.653	6.6401e-07
1.216	14.637	14.637	6.679e-07
1.218	14.62	14.62	6.7176e-07
1.22	14.603	14.603	6.7559e-07
1.222	14.587	14.587	6.7938e-07
1.224	14.57	14.57	6.8314e-07
1.226	14.554	14.554	6.8686e-07
1.228	14.537	14.537	6.9056e-07
1.23	14.521	14.521	6.9422e-07
1.232	14.505	14.505	6.9785e-07

1.234	14.489	14.489	7.0145e-07
1.236	14.473	14.473	7.0502e-07
1.238	14.457	14.457	7.0856e-07
1.24	14.441	14.441	7.1207e-07
1.242	14.425	14.425	7.1555e-07
1.244	14.409	14.409	7.1899e-07
1.246	14.394	14.394	7.2241e-07
1.248	14.378	14.378	7.2579e-07
1.25	14.362	14.363	7.2915e-07
1.252	14.347	14.347	7.3247e-07
1.254	14.332	14.332	7.3577e-07
1.256	14.316	14.316	7.3904e-07
1.258	14.301	14.301	7.4228e-07
1.26	14.286	14.286	7.4549e-07
1.262	14.271	14.271	7.4867e-07
1.264	14.256	14.256	7.5182e-07
1.266	14.241	14.241	7.5494e-07
1.268	14.226	14.226	7.5804e-07
1.27	14.211	14.211	7.611e-07
1.272	14.197	14.197	7.6414e-07
1.274	14.182	14.182	7.6715e-07
1.276	14.167	14.167	7.7014e-07
1.278	14.153	14.153	7.7309e-07
1.28	14.138	14.138	7.7602e-07

1.282	14.124	14.124	7.7892e-07
1.284	14.11	14.11	7.818e-07
1.286	14.095	14.095	7.8464e-07
1.288	14.081	14.081	7.8747e-07
1.29	14.067	14.067	7.9026e-07
1.292	14.053	14.053	7.9303e-07
1.294	14.039	14.039	7.9577e-07
1.296	14.025	14.025	7.9849e-07
1.298	14.011	14.011	8.0118e-07
1.3	13.998	13.998	8.0384e-07
1.302	13.984	13.984	8.0648e-07
1.304	13.97	13.97	8.091e-07
1.306	13.957	13.957	8.1169e-07
1.308	13.943	13.943	8.1425e-07
1.31	13.93	13.93	8.1679e-07
1.312	13.916	13.916	8.193e-07
1.314	13.903	13.903	8.2179e-07
1.316	13.89	13.89	8.2426e-07
1.318	13.877	13.877	8.267e-07
1.32	13.864	13.864	8.2911e-07
1.322	13.851	13.851	8.3151e-07
1.324	13.838	13.838	8.3387e-07
1.326	13.825	13.825	8.3622e-07
1.328	13.812	13.812	8.3854e-07

1.33	13.799	13.799	8.4084e-07
1.332	13.786	13.786	8.4311e-07
1.334	13.774	13.774	8.4536e-07
1.336	13.761	13.761	8.4759e-07
1.338	13.748	13.748	8.4979e-07
1.34	13.736	13.736	8.5198e-07
1.342	13.723	13.723	8.5414e-07
1.344	13.711	13.711	8.5627e-07
1.346	13.699	13.699	8.5839e-07
1.348	13.687	13.687	8.6048e-07
1.35	13.674	13.674	8.6255e-07
1.352	13.662	13.662	8.646e-07
1.354	13.65	13.65	8.6662e-07
1.356	13.638	13.638	8.6863e-07
1.358	13.626	13.626	8.7061e-07
1.36	13.614	13.614	8.7257e-07
1.362	13.602	13.602	8.7451e-07
1.364	13.591	13.591	8.7643e-07
1.366	13.579	13.579	8.7832e-07
1.368	13.567	13.567	8.802e-07
1.37	13.556	13.556	8.8206e-07
1.372	13.544	13.544	8.8389e-07
1.374	13.533	13.533	8.857e-07
1.376	13.521	13.521	8.875e-07

1.378	13.51	13.51	8.8927e-07
1.38	13.499	13.499	8.9102e-07
1.382	13.487	13.487	8.9275e-07
1.384	13.476	13.476	8.9446e-07
1.386	13.465	13.465	8.9616e-07
1.388	13.454	13.454	8.9783e-07
1.39	13.443	13.443	8.9948e-07
1.392	13.432	13.432	9.0111e-07
1.394	13.421	13.421	9.0272e-07
1.396	13.41	13.41	9.0432e-07
1.398	13.399	13.399	9.0589e-07
1.4	13.389	13.389	9.0745e-07
1.402	13.378	13.378	9.0898e-07
1.404	13.367	13.367	9.105e-07
1.406	13.357	13.357	9.1199e-07
1.408	13.346	13.346	9.1347e-07
1.41	13.336	13.336	9.1493e-07
1.412	13.325	13.325	9.1637e-07
1.414	13.315	13.315	9.178e-07
1.416	13.304	13.304	9.192e-07
1.418	13.294	13.294	9.2059e-07
1.42	13.284	13.284	9.2196e-07
1.422	13.274	13.274	9.2331e-07
1.424	13.264	13.264	9.2464e-07

1.426	13.254	13.254	9.2595e-07
1.428	13.244	13.244	9.2725e-07
1.43	13.234	13.234	9.2853e-07
1.432	13.224	13.224	9.2979e-07
1.434	13.214	13.214	9.3103e-07
1.436	13.204	13.204	9.3226e-07
1.438	13.194	13.194	9.3346e-07
1.44	13.185	13.185	9.3465e-07
1.442	13.175	13.175	9.3583e-07
1.444	13.165	13.165	9.3699e-07
1.446	13.156	13.156	9.3813e-07
1.448	13.146	13.146	9.3925e-07
1.45	13.137	13.137	9.4036e-07
1.452	13.128	13.128	9.4145e-07
1.454	13.118	13.118	9.4252e-07
1.456	13.109	13.109	9.4357e-07
1.458	13.1	13.1	9.4461e-07
1.46	13.091	13.091	9.4564e-07
1.462	13.081	13.081	9.4665e-07
1.464	13.072	13.072	9.4764e-07
1.466	13.063	13.063	9.4861e-07
1.468	13.054	13.054	9.4957e-07
1.47	13.045	13.045	9.5052e-07
1.472	13.036	13.036	9.5144e-07

1.474	13.027	13.027	9.5236e-07
1.476	13.019	13.019	9.5325e-07
1.478	13.01	13.01	9.5413e-07
1.48	13.001	13.001	9.55e-07
1.482	12.993	12.993	9.5585e-07
1.484	12.984	12.984	9.5668e-07
1.486	12.975	12.975	9.575e-07
1.488	12.967	12.967	9.5831e-07
1.49	12.958	12.958	9.5909e-07
1.492	12.95	12.95	9.5987e-07
1.494	12.942	12.942	9.6063e-07
1.496	12.933	12.933	9.6137e-07
1.498	12.925	12.925	9.621e-07
1.5	12.917	12.917	9.6282e-07
1.502	12.908	12.908	9.6352e-07
1.504	12.9	12.9	9.642e-07
1.506	12.892	12.892	9.6487e-07
1.508	12.884	12.884	9.6553e-07
1.51	12.876	12.876	9.6617e-07
1.512	12.868	12.868	9.668e-07
1.514	12.86	12.86	9.6742e-07
1.516	12.852	12.852	9.6802e-07
1.518	12.845	12.845	9.686e-07
1.52	12.837	12.837	9.6918e-07

1.522	12.829	12.829	9.6973e-07
1.524	12.821	12.821	9.7028e-07
1.526	12.814	12.814	9.7081e-07
1.528	12.806	12.806	9.7133e-07
1.53	12.798	12.798	9.7183e-07
1.532	12.791	12.791	9.7232e-07
1.534	12.783	12.783	9.728e-07
1.536	12.776	12.776	9.7326e-07
1.538	12.769	12.769	9.7371e-07
1.54	12.761	12.761	9.7415e-07
1.542	12.754	12.754	9.7457e-07
1.544	12.747	12.747	9.7499e-07
1.546	12.739	12.739	9.7538e-07
1.548	12.732	12.732	9.7577e-07
1.55	12.725	12.725	9.7614e-07
1.552	12.718	12.718	9.765e-07
1.554	12.711	12.711	9.7685e-07
1.556	12.704	12.704	9.7718e-07
1.558	12.697	12.697	9.775e-07
1.56	12.69	12.69	9.7781e-07
1.562	12.683	12.683	9.7811e-07
1.564	12.676	12.676	9.7839e-07
1.566	12.669	12.669	9.7866e-07
1.568	12.663	12.663	9.7892e-07

1.57	12.656	12.656	9.7917e-07
1.572	12.649	12.649	9.794e-07
1.574	12.643	12.643	9.7963e-07
1.576	12.636	12.636	9.7984e-07
1.578	12.63	12.63	9.8004e-07
1.58	12.623	12.623	9.8022e-07
1.582	12.617	12.617	9.804e-07
1.584	12.61	12.61	9.8056e-07
1.586	12.604	12.604	9.8071e-07
1.588	12.597	12.597	9.8085e-07
1.59	12.591	12.591	9.8098e-07
1.592	12.585	12.585	9.811e-07
1.594	12.578	12.578	9.8121e-07
1.596	12.572	12.572	9.813e-07
1.598	12.566	12.566	9.8138e-07
1.6	12.56	12.56	9.8145e-07
1.602	12.554	12.554	9.8151e-07
1.604	12.548	12.548	9.8156e-07
1.606	12.542	12.542	9.816e-07
1.608	12.536	12.536	9.8163e-07
1.61	12.53	12.53	9.8164e-07
1.612	12.524	12.524	9.8165e-07
1.614	12.518	12.518	9.8164e-07
1.616	12.512	12.512	9.8163e-07

1.618	12.507	12.507	9.816e-07
1.62	12.501	12.501	9.8156e-07
1.622	12.495	12.495	9.8151e-07
1.624	12.49	12.49	9.8145e-07
1.626	12.484	12.484	9.8138e-07
1.628	12.478	12.478	9.813e-07
1.63	12.473	12.473	9.8121e-07
1.632	12.467	12.467	9.8111e-07
1.634	12.462	12.462	9.81e-07
1.636	12.456	12.456	9.8087e-07
1.638	12.451	12.451	9.8074e-07
1.64	12.446	12.446	9.806e-07
1.642	12.44	12.44	9.8045e-07
1.644	12.435	12.435	9.8028e-07
1.646	12.43	12.43	9.8011e-07
1.648	12.425	12.425	9.7993e-07
1.65	12.419	12.419	9.7974e-07
1.652	12.414	12.414	9.7953e-07
1.654	12.409	12.409	9.7932e-07
1.656	12.404	12.404	9.791e-07
1.658	12.399	12.399	9.7887e-07
1.66	12.394	12.394	9.7863e-07
1.662	12.389	12.389	9.7838e-07
1.664	12.384	12.384	9.7812e-07

1.666	12.379	12.379	9.7785e-07
1.668	12.375	12.375	9.7757e-07
1.67	12.37	12.37	9.7728e-07
1.672	12.365	12.365	9.7698e-07
1.674	12.36	12.36	9.7667e-07
1.676	12.356	12.356	9.7635e-07
1.678	12.351	12.351	9.7603e-07
1.68	12.346	12.346	9.7569e-07
1.682	12.342	12.342	9.7535e-07
1.684	12.337	12.337	9.7499e-07
1.686	12.333	12.333	9.7463e-07
1.688	12.328	12.328	9.7426e-07
1.69	12.324	12.324	9.7388e-07
1.692	12.319	12.319	9.7349e-07
1.694	12.315	12.315	9.7309e-07
1.696	12.31	12.31	9.7268e-07
1.698	12.306	12.306	9.7227e-07
1.7	12.302	12.302	9.7184e-07
1.702	12.298	12.298	9.7141e-07
1.704	12.293	12.293	9.7097e-07
1.706	12.289	12.289	9.7052e-07
1.708	12.285	12.285	9.7006e-07
1.71	12.281	12.281	9.6959e-07
1.712	12.277	12.277	9.6912e-07

1.714	12.273	12.273	9.6863e-07
1.716	12.269	12.269	9.6814e-07
1.718	12.265	12.265	9.6764e-07
1.72	12.261	12.261	9.6713e-07
1.722	12.257	12.257	9.6661e-07
1.724	12.253	12.253	9.6609e-07
1.726	12.249	12.249	9.6555e-07
1.728	12.245	12.245	9.6501e-07
1.73	12.241	12.241	9.6446e-07
1.732	12.238	12.238	9.639e-07
1.734	12.234	12.234	9.6334e-07
1.736	12.23	12.23	9.6276e-07
1.738	12.227	12.227	9.6218e-07
1.74	12.223	12.223	9.6159e-07
1.742	12.219	12.219	9.6099e-07
1.744	12.216	12.216	9.6039e-07
1.746	12.212	12.212	9.5978e-07
1.748	12.209	12.209	9.5916e-07
1.75	12.205	12.205	9.5853e-07
1.752	12.202	12.202	9.5789e-07
1.754	12.199	12.199	9.5725e-07
1.756	12.195	12.195	9.566e-07
1.758	12.192	12.192	9.5594e-07
1.76	12.189	12.189	9.5527e-07

1.762	12.185	12.185	9.546e-07
1.764	12.182	12.182	9.5392e-07
1.766	12.179	12.179	9.5323e-07
1.768	12.176	12.176	9.5254e-07
1.77	12.172	12.172	9.5183e-07
1.772	12.169	12.169	9.5112e-07
1.774	12.166	12.166	9.5041e-07
1.776	12.163	12.163	9.4968e-07
1.778	12.16	12.16	9.4895e-07
1.78	12.157	12.157	9.4821e-07
1.782	12.154	12.154	9.4747e-07
1.784	12.151	12.151	9.4671e-07
1.786	12.148	12.148	9.4596e-07
1.788	12.145	12.145	9.4519e-07
1.79	12.143	12.143	9.4442e-07
1.792	12.14	12.14	9.4364e-07
1.794	12.137	12.137	9.4285e-07
1.796	12.134	12.134	9.4206e-07
1.798	12.132	12.132	9.4126e-07
1.8	12.129	12.129	9.4045e-07
1.802	12.126	12.126	9.3963e-07
1.804	12.124	12.124	9.3881e-07
1.806	12.121	12.121	9.3799e-07
1.808	12.118	12.118	9.3715e-07

1.81	12.116	12.116	9.3631e-07
1.812	12.113	12.113	9.3547e-07
1.814	12.111	12.111	9.3461e-07
1.816	12.108	12.108	9.3375e-07
1.818	12.106	12.106	9.3289e-07
1.82	12.104	12.104	9.3202e-07
1.822	12.101	12.101	9.3114e-07
1.824	12.099	12.099	9.3025e-07
1.826	12.097	12.097	9.2936e-07
1.828	12.094	12.094	9.2846e-07
1.83	12.092	12.092	9.2756e-07
1.832	12.09	12.09	9.2665e-07
1.834	12.088	12.088	9.2573e-07
1.836	12.085	12.085	9.2481e-07
1.838	12.083	12.083	9.2388e-07
1.84	12.081	12.081	9.2295e-07
1.842	12.079	12.079	9.2201e-07
1.844	12.077	12.077	9.2106e-07
1.846	12.075	12.075	9.2011e-07
1.848	12.073	12.073	9.1915e-07
1.85	12.071	12.071	9.1819e-07
1.852	12.069	12.069	9.1722e-07
1.854	12.067	12.067	9.1624e-07
1.856	12.065	12.065	9.1526e-07

1.858	12.064	12.064	9.1427e-07
1.86	12.062	12.062	9.1328e-07
1.862	12.06	12.06	9.1228e-07
1.864	12.058	12.058	9.1128e-07
1.866	12.056	12.056	9.1027e-07
1.868	12.055	12.055	9.0925e-07
1.87	12.053	12.053	9.0823e-07
1.872	12.051	12.051	9.0721e-07
1.874	12.05	12.05	9.0617e-07
1.876	12.048	12.048	9.0514e-07
1.878	12.047	12.047	9.0409e-07
1.88	12.045	12.045	9.0304e-07
1.882	12.044	12.044	9.0199e-07
1.884	12.042	12.042	9.0093e-07
1.886	12.041	12.041	8.9986e-07
1.888	12.039	12.039	8.9879e-07
1.89	12.038	12.038	8.9772e-07
1.892	12.036	12.036	8.9664e-07
1.894	12.035	12.035	8.9555e-07
1.896	12.034	12.034	8.9446e-07
1.898	12.032	12.032	8.9336e-07
1.9	12.031	12.031	8.9226e-07
1.902	12.03	12.03	8.9116e-07
1.904	12.029	12.029	8.9004e-07

1.906	12.027	12.027	8.8893e-07
1.908	12.026	12.026	8.878e-07
1.91	12.025	12.025	8.8668e-07
1.912	12.024	12.024	8.8555e-07
1.914	12.023	12.023	8.8441e-07
1.916	12.022	12.022	8.8327e-07
1.918	12.021	12.021	8.8212e-07
1.92	12.02	12.02	8.8097e-07
1.922	12.019	12.019	8.7981e-07
1.924	12.018	12.018	8.7865e-07
1.926	12.017	12.017	8.7748e-07
1.928	12.016	12.016	8.7631e-07
1.93	12.015	12.015	8.7514e-07
1.932	12.014	12.014	8.7395e-07
1.934	12.013	12.013	8.7277e-07
1.936	12.013	12.013	8.7158e-07
1.938	12.012	12.012	8.7038e-07
1.94	12.011	12.011	8.6918e-07
1.942	12.01	12.01	8.6798e-07
1.944	12.01	12.01	8.6677e-07
1.946	12.009	12.009	8.6556e-07
1.948	12.008	12.008	8.6434e-07
1.95	12.008	12.008	8.6312e-07
1.952	12.007	12.007	8.6189e-07

1.954	12.006	12.006	8.6066e-07
1.956	12.006	12.006	8.5942e-07
1.958	12.005	12.005	8.5818e-07
1.96	12.005	12.005	8.5694e-07
1.962	12.004	12.004	8.5569e-07
1.964	12.004	12.004	8.5443e-07
1.966	12.004	12.004	8.5318e-07
1.968	12.003	12.003	8.5191e-07
1.97	12.003	12.003	8.5065e-07
1.972	12.002	12.002	8.4938e-07
1.974	12.002	12.002	8.481e-07
1.976	12.002	12.002	8.4682e-07
1.978	12.001	12.001	8.4554e-07
1.98	12.001	12.001	8.4425e-07
1.982	12.001	12.001	8.4296e-07
1.984	12.001	12.001	8.4166e-07
1.986	12.001	12.001	8.4036e-07
1.988	12	12	8.3906e-07
1.99	12	12	8.3775e-07
1.992	12	12	8.3644e-07
1.994	12	12	8.3512e-07
1.996	12	12	8.338e-07
1.998	12	12	8.3248e-07
2	12	12	8.3115e-07

2.002	12	12	8.2982e-07
2.004	12	12	8.2848e-07
2.006	12	12	8.2714e-07
2.008	12	12	8.258e-07
2.01	12	12	8.2445e-07
2.012	12	12	8.231e-07
2.014	12.001	12.001	8.2174e-07
2.016	12.001	12.001	8.2038e-07
2.018	12.001	12.001	8.1902e-07
2.02	12.001	12.001	8.1765e-07
2.022	12.001	12.001	8.1628e-07
2.024	12.002	12.002	8.149e-07
2.026	12.002	12.002	8.1353e-07
2.028	12.002	12.002	8.1214e-07
2.03	12.003	12.003	8.1076e-07
2.032	12.003	12.003	8.0937e-07
2.034	12.003	12.003	8.0798e-07
2.036	12.004	12.004	8.0658e-07
2.038	12.004	12.004	8.0518e-07
2.04	12.005	12.005	8.0378e-07
2.042	12.005	12.005	8.0237e-07
2.044	12.006	12.006	8.0096e-07
2.046	12.006	12.006	7.9954e-07
2.048	12.007	12.007	7.9813e-07

2.05	12.007	12.007	7.967e-07
2.052	12.008	12.008	7.9528e-07
2.054	12.009	12.009	7.9385e-07
2.056	12.009	12.009	7.9242e-07
2.058	12.01	12.01	7.9098e-07
2.06	12.011	12.011	7.8955e-07
2.062	12.011	12.011	7.881e-07
2.064	12.012	12.012	7.8666e-07
2.066	12.013	12.013	7.8521e-07
2.068	12.014	12.014	7.8376e-07
2.07	12.014	12.014	7.823e-07
2.072	12.015	12.015	7.8085e-07
2.074	12.016	12.016	7.7938e-07
2.076	12.017	12.017	7.7792e-07
2.078	12.018	12.018	7.7645e-07
2.08	12.019	12.019	7.7498e-07
2.082	12.02	12.02	7.7351e-07
2.084	12.021	12.021	7.7203e-07
2.086	12.022	12.022	7.7055e-07
2.088	12.023	12.023	7.6906e-07
2.09	12.024	12.024	7.6758e-07
2.092	12.025	12.025	7.6609e-07
2.094	12.026	12.026	7.6459e-07
2.096	12.027	12.027	7.631e-07

2.098	12.028	12.028	7.616e-07
2.1	12.029	12.029	7.601e-07
2.102	12.03	12.03	7.5859e-07
2.104	12.031	12.031	7.5708e-07
2.106	12.033	12.033	7.5557e-07
2.108	12.034	12.034	7.5406e-07
2.11	12.035	12.035	7.5254e-07
2.112	12.036	12.036	7.5102e-07
2.114	12.038	12.038	7.495e-07
2.116	12.039	12.039	7.4797e-07
2.118	12.04	12.04	7.4644e-07
2.12	12.042	12.042	7.4491e-07
2.122	12.043	12.043	7.4338e-07
2.124	12.044	12.044	7.4184e-07
2.126	12.046	12.046	7.403e-07
2.128	12.047	12.047	7.3876e-07
2.13	12.049	12.049	7.3721e-07
2.132	12.05	12.05	7.3566e-07
2.134	12.052	12.052	7.3411e-07
2.136	12.053	12.053	7.3256e-07
2.138	12.055	12.055	7.31e-07
2.14	12.056	12.056	7.2944e-07
2.142	12.058	12.058	7.2788e-07
2.144	12.059	12.059	7.2632e-07

2.146	12.061	12.061	7.2475e-07
2.148	12.063	12.063	7.2318e-07
2.15	12.064	12.064	7.2161e-07
2.152	12.066	12.066	7.2003e-07
2.154	12.068	12.068	7.1845e-07
2.156	12.069	12.069	7.1687e-07
2.158	12.071	12.071	7.1529e-07
2.16	12.073	12.073	7.1371e-07
2.162	12.075	12.075	7.1212e-07
2.164	12.077	12.077	7.1053e-07
2.166	12.078	12.078	7.0894e-07
2.168	12.08	12.08	7.0734e-07
2.17	12.082	12.082	7.0574e-07
2.172	12.084	12.084	7.0414e-07
2.174	12.086	12.086	7.0254e-07
2.176	12.088	12.088	7.0094e-07
2.178	12.09	12.09	6.9933e-07
2.18	12.092	12.092	6.9772e-07
2.182	12.094	12.094	6.9611e-07
2.184	12.096	12.096	6.945e-07
2.186	12.098	12.098	6.9288e-07
2.188	12.1	12.1	6.9126e-07
2.19	12.102	12.102	6.8964e-07
2.192	12.104	12.104	6.8802e-07

2.194	12.106	12.106	6.8639e-07
2.196	12.108	12.108	6.8476e-07
2.198	12.111	12.111	6.8313e-07
2.2	12.113	12.113	6.815e-07
2.202	12.115	12.115	6.7987e-07
2.204	12.117	12.117	6.7823e-07
2.206	12.119	12.119	6.7659e-07
2.208	12.122	12.122	6.7495e-07
2.21	12.124	12.124	6.7331e-07
2.212	12.126	12.126	6.7166e-07
2.214	12.129	12.129	6.7002e-07
2.216	12.131	12.131	6.6837e-07
2.218	12.133	12.133	6.6672e-07
2.22	12.136	12.136	6.6506e-07
2.222	12.138	12.138	6.6341e-07
2.224	12.14	12.14	6.6175e-07
2.226	12.143	12.143	6.6009e-07
2.228	12.145	12.145	6.5843e-07
2.23	12.148	12.148	6.5677e-07
2.232	12.15	12.15	6.551e-07
2.234	12.153	12.153	6.5343e-07
2.236	12.155	12.155	6.5176e-07
2.238	12.158	12.158	6.5009e-07
2.24	12.16	12.16	6.4842e-07

2.242	12.163	12.163	6.4675e-07
2.244	12.166	12.166	6.4507e-07
2.246	12.168	12.168	6.4339e-07
2.248	12.171	12.171	6.4171e-07
2.25	12.174	12.174	6.4003e-07
2.252	12.176	12.176	6.3834e-07
2.254	12.179	12.179	6.3666e-07
2.256	12.182	12.182	6.3497e-07
2.258	12.184	12.184	6.3328e-07
2.26	12.187	12.187	6.3159e-07
2.262	12.19	12.19	6.299e-07
2.264	12.193	12.193	6.282e-07
2.266	12.196	12.196	6.2651e-07
2.268	12.198	12.198	6.2481e-07
2.27	12.201	12.201	6.2311e-07
2.272	12.204	12.204	6.2141e-07
2.274	12.207	12.207	6.1971e-07
2.276	12.21	12.21	6.18e-07
2.278	12.213	12.213	6.163e-07
2.28	12.216	12.216	6.1459e-07
2.282	12.219	12.219	6.1288e-07
2.284	12.222	12.222	6.1117e-07
2.286	12.225	12.225	6.0946e-07
2.288	12.228	12.228	6.0775e-07

2.29	12.231	12.231	6.0603e-07
2.292	12.234	12.234	6.0432e-07
2.294	12.237	12.237	6.026e-07
2.296	12.24	12.24	6.0088e-07
2.298	12.243	12.243	5.9916e-07
2.3	12.247	12.247	5.9743e-07
2.302	12.25	12.25	5.9571e-07
2.304	12.253	12.253	5.9399e-07
2.306	12.256	12.256	5.9226e-07
2.308	12.259	12.259	5.9053e-07
2.31	12.263	12.263	5.888e-07
2.312	12.266	12.266	5.8707e-07
2.314	12.269	12.269	5.8534e-07
2.316	12.272	12.272	5.8361e-07
2.318	12.276	12.276	5.8187e-07
2.32	12.279	12.279	5.8014e-07
2.322	12.282	12.282	5.784e-07
2.324	12.286	12.286	5.7666e-07
2.326	12.289	12.289	5.7492e-07
2.328	12.292	12.292	5.7318e-07
2.33	12.296	12.296	5.7144e-07
2.332	12.299	12.299	5.697e-07
2.334	12.303	12.303	5.6795e-07
2.336	12.306	12.306	5.6621e-07

2.338	12.31	12.31	5.6446e-07
2.34	12.313	12.313	5.6271e-07
2.342	12.317	12.317	5.6097e-07
2.344	12.32	12.32	5.5922e-07
2.346	12.324	12.324	5.5747e-07
2.348	12.327	12.327	5.5571e-07
2.35	12.331	12.331	5.5396e-07
2.352	12.335	12.335	5.5221e-07
2.354	12.338	12.338	5.5045e-07
2.356	12.342	12.342	5.487e-07
2.358	12.346	12.346	5.4694e-07
2.36	12.349	12.349	5.4518e-07
2.362	12.353	12.353	5.4342e-07
2.364	12.357	12.357	5.4166e-07
2.366	12.36	12.36	5.399e-07
2.368	12.364	12.364	5.3814e-07
2.37	12.368	12.368	5.3638e-07
2.372	12.372	12.372	5.3461e-07
2.374	12.376	12.376	5.3285e-07
2.376	12.379	12.379	5.3108e-07
2.378	12.383	12.383	5.2932e-07
2.38	12.387	12.387	5.2755e-07
2.382	12.391	12.391	5.2578e-07
2.384	12.395	12.395	5.2402e-07

2.386	12.399	12.399	5.2225e-07
2.388	12.403	12.403	5.2048e-07
2.39	12.407	12.407	5.1871e-07
2.392	12.411	12.411	5.1693e-07
2.394	12.415	12.415	5.1516e-07
2.396	12.419	12.419	5.1339e-07
2.398	12.423	12.423	5.1162e-07
2.4	12.427	12.427	5.0984e-07
2.402	12.431	12.431	5.0807e-07
2.404	12.435	12.435	5.0629e-07
2.406	12.439	12.439	5.0452e-07
2.408	12.443	12.443	5.0274e-07
2.41	12.447	12.447	5.0096e-07
2.412	12.451	12.451	4.9918e-07
2.414	12.455	12.455	4.9741e-07
2.416	12.46	12.46	4.9563e-07
2.418	12.464	12.464	4.9385e-07
2.42	12.468	12.468	4.9207e-07
2.422	12.472	12.472	4.9029e-07
2.424	12.476	12.476	4.8851e-07
2.426	12.481	12.481	4.8672e-07
2.428	12.485	12.485	4.8494e-07
2.43	12.489	12.489	4.8316e-07
2.432	12.494	12.494	4.8138e-07

2.434	12.498	12.498	4.7959e-07
2.436	12.502	12.502	4.7781e-07
2.438	12.507	12.507	4.7602e-07
2.44	12.511	12.511	4.7424e-07
2.442	12.515	12.515	4.7245e-07
2.444	12.52	12.52	4.7067e-07
2.446	12.524	12.524	4.6888e-07
2.448	12.529	12.529	4.671e-07
2.45	12.533	12.533	4.6531e-07
2.452	12.538	12.538	4.6353e-07
2.454	12.542	12.542	4.6174e-07
2.456	12.547	12.547	4.5995e-07
2.458	12.551	12.551	4.5816e-07
2.46	12.556	12.556	4.5638e-07
2.462	12.56	12.56	4.5459e-07
2.464	12.565	12.565	4.528e-07
2.466	12.569	12.569	4.5101e-07
2.468	12.574	12.574	4.4922e-07
2.47	12.579	12.579	4.4743e-07
2.472	12.583	12.583	4.4565e-07
2.474	12.588	12.588	4.4386e-07
2.476	12.593	12.593	4.4207e-07
2.478	12.597	12.597	4.4028e-07
2.48	12.602	12.602	4.3849e-07

2.482	12.607	12.607	4.367e-07
2.484	12.611	12.611	4.3491e-07
2.486	12.616	12.616	4.3312e-07
2.488	12.621	12.621	4.3133e-07
2.49	12.626	12.626	4.2954e-07
2.492	12.631	12.631	4.2775e-07
2.494	12.635	12.635	4.2596e-07
2.496	12.64	12.64	4.2417e-07
2.498	12.645	12.645	4.2238e-07
2.5	12.65	12.65	4.2059e-07
2.502	12.655	12.655	4.188e-07
2.504	12.66	12.66	4.1701e-07
2.506	12.665	12.665	4.1522e-07
2.508	12.67	12.67	4.1343e-07
2.51	12.675	12.675	4.1164e-07
2.512	12.68	12.68	4.0986e-07
2.514	12.685	12.685	4.0807e-07
2.516	12.69	12.69	4.0628e-07
2.518	12.695	12.695	4.0449e-07
2.52	12.7	12.7	4.027e-07
2.522	12.705	12.705	4.0091e-07
2.524	12.71	12.71	3.9912e-07
2.526	12.715	12.715	3.9733e-07
2.528	12.72	12.72	3.9555e-07

2.53	12.725	12.725	3.9376e-07
2.532	12.73	12.73	3.9197e-07
2.534	12.735	12.735	3.9018e-07
2.536	12.74	12.74	3.884e-07
2.538	12.746	12.746	3.8661e-07
2.54	12.751	12.751	3.8482e-07
2.542	12.756	12.756	3.8304e-07
2.544	12.761	12.761	3.8125e-07
2.546	12.766	12.766	3.7947e-07
2.548	12.772	12.772	3.7768e-07
2.55	12.777	12.777	3.759e-07
2.552	12.782	12.782	3.7411e-07
2.554	12.788	12.788	3.7233e-07
2.556	12.793	12.793	3.7054e-07
2.558	12.798	12.798	3.6876e-07
2.56	12.804	12.804	3.6698e-07
2.562	12.809	12.809	3.6519e-07
2.564	12.814	12.814	3.6341e-07
2.566	12.82	12.82	3.6163e-07
2.568	12.825	12.825	3.5985e-07
2.57	12.831	12.831	3.5807e-07
2.572	12.836	12.836	3.5629e-07
2.574	12.841	12.841	3.5451e-07
2.576	12.847	12.847	3.5273e-07

2.578	12.852	12.852	3.5095e-07
2.58	12.858	12.858	3.4917e-07
2.582	12.863	12.863	3.4739e-07
2.584	12.869	12.869	3.4561e-07
2.586	12.875	12.875	3.4384e-07
2.588	12.88	12.88	3.4206e-07
2.59	12.886	12.886	3.4028e-07
2.592	12.891	12.891	3.3851e-07
2.594	12.897	12.897	3.3673e-07
2.596	12.903	12.903	3.3496e-07
2.598	12.908	12.908	3.3319e-07
2.6	12.914	12.914	3.3141e-07
2.602	12.92	12.92	3.2964e-07
2.604	12.925	12.925	3.2787e-07
2.606	12.931	12.931	3.261e-07
2.608	12.937	12.937	3.2433e-07
2.61	12.942	12.942	3.2256e-07
2.612	12.948	12.948	3.2079e-07
2.614	12.954	12.954	3.1902e-07
2.616	12.96	12.96	3.1725e-07
2.618	12.965	12.965	3.1549e-07
2.62	12.971	12.971	3.1372e-07
2.622	12.977	12.977	3.1196e-07
2.624	12.983	12.983	3.1019e-07

2.626	12.989	12.989	3.0843e-07
2.628	12.995	12.995	3.0667e-07
2.63	13.001	13.001	3.049e-07
2.632	13.006	13.006	3.0314e-07
2.634	13.012	13.012	3.0138e-07
2.636	13.018	13.018	2.9962e-07
2.638	13.024	13.024	2.9786e-07
2.64	13.03	13.03	2.961e-07
2.642	13.036	13.036	2.9435e-07
2.644	13.042	13.042	2.9259e-07
2.646	13.048	13.048	2.9083e-07
2.648	13.054	13.054	2.8908e-07
2.65	13.06	13.06	2.8732e-07
2.652	13.066	13.066	2.8557e-07
2.654	13.072	13.072	2.8382e-07
2.656	13.078	13.078	2.8207e-07
2.658	13.085	13.085	2.8032e-07
2.66	13.091	13.091	2.7857e-07
2.662	13.097	13.097	2.7682e-07
2.664	13.103	13.103	2.7507e-07
2.666	13.109	13.109	2.7332e-07
2.668	13.115	13.115	2.7158e-07
2.67	13.121	13.121	2.6983e-07
2.672	13.128	13.128	2.6809e-07

2.674	13.134	13.134	2.6634e-07
2.676	13.14	13.14	2.646e-07
2.678	13.146	13.146	2.6286e-07
2.68	13.153	13.153	2.6112e-07
2.682	13.159	13.159	2.5938e-07
2.684	13.165	13.165	2.5764e-07
2.686	13.171	13.171	2.5591e-07
2.688	13.178	13.178	2.5417e-07
2.69	13.184	13.184	2.5244e-07
2.692	13.19	13.19	2.507e-07
2.694	13.197	13.197	2.4897e-07
2.696	13.203	13.203	2.4724e-07
2.698	13.21	13.21	2.4551e-07
2.7	13.216	13.216	2.4378e-07
2.702	13.222	13.222	2.4205e-07
2.704	13.229	13.229	2.4032e-07
2.706	13.235	13.235	2.3859e-07
2.708	13.242	13.242	2.3687e-07
2.71	13.248	13.248	2.3514e-07
2.712	13.255	13.255	2.3342e-07
2.714	13.261	13.261	2.317e-07
2.716	13.268	13.268	2.2998e-07
2.718	13.274	13.274	2.2826e-07
2.72	13.281	13.281	2.2654e-07

2.722	13.287	13.287	2.2482e-07
2.724	13.294	13.294	2.2311e-07
2.726	13.3	13.3	2.2139e-07
2.728	13.307	13.307	2.1968e-07
2.73	13.314	13.314	2.1797e-07
2.732	13.32	13.32	2.1625e-07
2.734	13.327	13.327	2.1454e-07
2.736	13.334	13.334	2.1283e-07
2.738	13.34	13.34	2.1113e-07
2.74	13.347	13.347	2.0942e-07
2.742	13.354	13.354	2.0771e-07
2.744	13.36	13.36	2.0601e-07
2.746	13.367	13.367	2.0431e-07
2.748	13.374	13.374	2.0261e-07
2.75	13.381	13.381	2.0091e-07
2.752	13.387	13.387	1.9921e-07
2.754	13.394	13.394	1.9751e-07
2.756	13.401	13.401	1.9581e-07
2.758	13.408	13.408	1.9412e-07
2.76	13.415	13.415	1.9242e-07
2.762	13.422	13.422	1.9073e-07
2.764	13.428	13.428	1.8904e-07
2.766	13.435	13.435	1.8735e-07
2.768	13.442	13.442	1.8566e-07

2.77	13.449	13.449	1.8397e-07
2.772	13.456	13.456	1.8228e-07
2.774	13.463	13.463	1.806e-07
2.776	13.47	13.47	1.7892e-07
2.778	13.477	13.477	1.7723e-07
2.78	13.484	13.484	1.7555e-07
2.782	13.491	13.491	1.7387e-07
2.784	13.498	13.498	1.722e-07
2.786	13.505	13.505	1.7052e-07
2.788	13.512	13.512	1.6884e-07
2.79	13.519	13.519	1.6717e-07
2.792	13.526	13.526	1.655e-07
2.794	13.533	13.533	1.6382e-07
2.796	13.54	13.54	1.6215e-07
2.798	13.547	13.547	1.6049e-07
2.8	13.554	13.554	1.5882e-07
2.802	13.561	13.561	1.5715e-07
2.804	13.569	13.569	1.5549e-07
2.806	13.576	13.576	1.5383e-07
2.808	13.583	13.583	1.5216e-07
2.81	13.59	13.59	1.505e-07
2.812	13.597	13.597	1.4885e-07
2.814	13.604	13.604	1.4719e-07
2.816	13.612	13.612	1.4553e-07

2.818	13.619	13.619	1.4388e-07
2.82	13.626	13.626	1.4223e-07
2.822	13.633	13.633	1.4057e-07
2.824	13.641	13.641	1.3892e-07
2.826	13.648	13.648	1.3728e-07
2.828	13.655	13.655	1.3563e-07
2.83	13.663	13.663	1.3398e-07
2.832	13.67	13.67	1.3234e-07
2.834	13.677	13.677	1.307e-07
2.836	13.685	13.685	1.2906e-07
2.838	13.692	13.692	1.2742e-07
2.84	13.699	13.699	1.2578e-07
2.842	13.707	13.707	1.2414e-07
2.844	13.714	13.714	1.2251e-07
2.846	13.722	13.722	1.2087e-07
2.848	13.729	13.729	1.1924e-07
2.85	13.737	13.737	1.1761e-07
2.852	13.744	13.744	1.1598e-07
2.854	13.751	13.751	1.1436e-07
2.856	13.759	13.759	1.1273e-07
2.858	13.766	13.766	1.1111e-07
2.86	13.774	13.774	1.0948e-07
2.862	13.782	13.782	1.0786e-07
2.864	13.789	13.789	1.0624e-07

2.866	13.797	13.797	1.0462e-07
2.868	13.804	13.804	1.0301e-07
2.87	13.812	13.812	1.0139e-07
2.872	13.819	13.819	9.9779e-08
2.874	13.827	13.827	9.8168e-08
2.876	13.835	13.835	9.6558e-08
2.878	13.842	13.842	9.4949e-08
2.88	13.85	13.85	9.3342e-08
2.882	13.858	13.858	9.1737e-08
2.884	13.865	13.865	9.0133e-08
2.886	13.873	13.873	8.8531e-08
2.888	13.881	13.881	8.693e-08
2.89	13.888	13.888	8.5331e-08
2.892	13.896	13.896	8.3734e-08
2.894	13.904	13.904	8.2139e-08
2.896	13.912	13.912	8.0545e-08
2.898	13.919	13.919	7.8952e-08
2.9	13.927	13.927	7.7361e-08
2.902	13.935	13.935	7.5772e-08
2.904	13.943	13.943	7.4185e-08
2.906	13.951	13.951	7.2599e-08
2.908	13.959	13.959	7.1015e-08
2.91	13.966	13.966	6.9432e-08
2.912	13.974	13.974	6.7852e-08

2.914	13.982	13.982	6.6273e-08
2.916	13.99	13.99	6.4695e-08
2.918	13.998	13.998	6.3119e-08
2.92	14.006	14.006	6.1545e-08
2.922	14.014	14.014	5.9973e-08
2.924	14.022	14.022	5.8402e-08
2.926	14.03	14.03	5.6833e-08
2.928	14.038	14.038	5.5265e-08
2.93	14.046	14.046	5.37e-08
2.932	14.054	14.054	5.2136e-08
2.934	14.062	14.062	5.0574e-08
2.936	14.07	14.07	4.9013e-08
2.938	14.078	14.078	4.7454e-08
2.94	14.086	14.086	4.5897e-08
2.942	14.094	14.094	4.4342e-08
2.944	14.102	14.102	4.2788e-08
2.946	14.11	14.11	4.1236e-08
2.948	14.118	14.118	3.9686e-08
2.95	14.126	14.126	3.8137e-08
2.952	14.134	14.134	3.659e-08
2.954	14.143	14.143	3.5045e-08
2.956	14.151	14.151	3.3502e-08
2.958	14.159	14.159	3.1961e-08
2.96	14.167	14.167	3.0421e-08

2.962	14.175	14.175	2.8883e-08
2.964	14.183	14.183	2.7347e-08
2.966	14.192	14.192	2.5812e-08
2.968	14.2	14.2	2.428e-08
2.97	14.208	14.208	2.2749e-08
2.972	14.216	14.216	2.1219e-08
2.974	14.225	14.225	1.9692e-08
2.976	14.233	14.233	1.8167e-08
2.978	14.241	14.241	1.6643e-08
2.98	14.25	14.25	1.5121e-08
2.982	14.258	14.258	1.3601e-08
2.984	14.266	14.266	1.2082e-08
2.986	14.275	14.275	1.0566e-08
2.988	14.283	14.283	9.0507e-09
2.99	14.291	14.291	7.5377e-09
2.992	14.3	14.3	6.0265e-09
2.994	14.308	14.308	4.5172e-09
2.996	14.316	14.316	3.0096e-09
2.998	14.325	14.325	1.5039e-09

Code

language-matlab

```matlab
clear;
clc;
close all;
```

```matlab
n = 999;
a  = 1;
b = 3;
alpha = 17;
beta = (43/3);
h = (b-a)/(n+1);

X = zeros(n,1);
W = zeros(n,1);

for i = 1:n
    X(i) = a + i*h;
    W(i) = ((beta-alpha)/(b-a)) * (X(i)-a) +
alpha;
end

i = 1;
Fw = compute_F(X,W,alpha,beta,h);
max_Fw = max(Fw);
MF = max_Fw;
tolerance = 10^-8;

while max_Fw > tolerance
    i = i+1;
    if i > 10
        disp('too many iterations')
```

```matlab
        break
    end

    [c,d,e] = J(X,W,alpha,beta,h);
    P = tridiag(c,d,e,-Fw);
    W = W + P;
    Fw = compute_F(X,W,alpha,beta,h);
    max_Fw = max(abs(Fw));
    MF = [MF; max_Fw];
end
y = compute_true_function(X);
error = abs(y-W);
max_error_w = max(abs(y-W));
format shortg
%print max error together
disp('max error in W is')
disp(max_error_w)
x_t_w_y_error = [X W y error]

%% Functions used
function true_val = compute_true_function(x)
    true_val = x.^2 + (16./x);
end

function f = compute_function(x,y,yprime)
    f = 4 + (1/4)*x^3 - y*yprime/8;
end
```

```matlab
function fy = compute_dfunction(x,y,yprime)
    fy = -yprime/8;
end


function fyy = compute_ddfunction(x,y,yprime)
    fyy = -y/8;
end


function Fw = compute_F(X,W,alpha,beta,h)
    n = length(X);
    Fw = zeros(n,1);

    dy1 = (W(2)-alpha)/(2*h);
    Fw(1) = -alpha + (2*W(1)) - W(2) +
h^2*compute_function(X(1),W(1), dy1);

    for i = 2:n-1
        dyi = (W(i+1)-W(i-1))/(2*h);
        Fw(i) = -W(i-1) + (2*W(i)) - W(i+1) +
h^2*compute_function(X(i),W(i), dyi);
    end

    dyn = (beta-W(n-1))/(2*h);
    Fw(n) = -W(n-1) + (2*W(n)) - beta +
h^2*compute_function(X(n),W(n), dyn);
```

```matlab
end

function [c,d,e] = J(X,W,alpha,beta,h)
    n = length(W);
    c = zeros(n,1);
    d = zeros(n,1);
    e = zeros(n,1);

    d(1) = 2 + h^2 * compute_dfunction(X(1),
W(1), (W(2)-alpha)/(2*h));
    e(1) = -1 + h^2 * compute_ddfunction(X(1),
W(1), (W(2)-alpha)/(2*h)) * (1/(2*h));

    for i = 2:n-1
        c(i) = -1 + h^2 *
compute_ddfunction(X(i), W(i), (W(i+1)-W(i-
1))/(2*h)) * (-1/(2*h));
        d(i) = 2 + h^2 * compute_dfunction(X(i),
W(i), (W(i+1)-W(i-1))/(2*h));
        e(i) = -1 + h^2 *
compute_ddfunction(X(i), W(i), (W(i+1)-W(i-
1))/(2*h)) * (1/(2*h));
    end

    c(n) = -1 + h^2 * compute_ddfunction(X(n),
W(n), (beta-W(n-1))/(2*h)) * (-1/(2*h));
    d(n) = 2 + h^2 * compute_dfunction(X(n),
```

```matlab
    W(n), (beta-W(n-1))/(2*h));
end

function W = tridiag(c,d,e,b)
    n = length(d);
    W = zeros(n,1);
    for k = 2:n
        mult = -c(k)/d(k-1);
        d(k) = mult*e(k-1) + d(k);
        b(k) = mult*b(k-1) + b(k);
    end
    W(n) = b(n)/d(n);
    for k = n-1:-1:1
        W(k) = (b(k)-e(k)*W(k+1))/d(k);
    end

end
```