HW3

```matlab
% Q1

b1 = [-0.5 -0.5 -0.5 -0.5 -0.5 -0.5]';
b2 = [0.1 0.1 0.1 0.1 0.1 0.1]';
b3 = [0.4 0.4 0.4 0.4 0.4 0.4]';
b4 = [1 1 1 1 1 1]';
b5 = [2 2 2 2 2 2]';

BHAT1 = [];
BHAT2 = [];
BHAT3 = [];
BHAT4 = [];

for b0 = [b1 b2 b3 b4 b5];

likelihood = @(b) -sum( -exp( X*b ) + y.*( X*b ) -
 log(factorial(y)) );

options = optimset('PlotFcns',@optimplotfval,'Display','iter');
bhat1 = fminsearch(likelihood,b0,options);

% Q2

options = optimoptions(@fminunc,'Display','iter','Algorithm','quasi-
newton');
% Default method here is BFGS
bhat2= fminunc(likelihood,b0,options);

% Q3

objective = @(b) ( y - exp( X*b ) );
options = optimoptions(@lsqnonlin,'Display','iter','Algorithm','trust-
region-reflective');
bhat3 = lsqnonlin(objective,b0,[],[],options);

% Q4

objective = @(b) sum( ( y - exp( X*b ) ).^2 );
options = optimset('PlotFcns',@optimplotfval,'Display','iter');
bhat4 = fminsearch(objective,b0,options);

BHAT1 = [BHAT1 bhat1];
BHAT2 = [BHAT2 bhat2];
BHAT3 = [BHAT3 bhat3];
BHAT4 = [BHAT4 bhat4];

end

BHAT1
BHAT2
```

```
BHAT3
BHAT4
```


% For robustness, method1 estimates relatively stably (roughly 2.5, 0, 0, -0.3, 0, -0.4)

% with various initial values.Thus, we can think this point as desired coefficient

% Method3 shows 3 stable results but intercepts of other 2 results blow off

% a bit. Method 2 and method 4 have respectively 2 and 1 stable results.

% Thus, I can rank method1 > method3 > method2 > method1 in order of

% robustness. But for time to convergence, you can easily check method2 >

% method3 > method1,method4

Iteration	Func-count	min f(x)	Procedure
0	1	25833.5	
1	7	25833.5	initial simplex
2	9	24564.2	expand
3	10	24564.2	reflect
4	11	24564.2	reflect
5	12	24564.2	reflect
6	13	24564.2	reflect
7	15	23513.5	expand
8	16	23513.5	reflect
9	17	23513.5	reflect
10	19	22037	expand
11	20	22037	reflect
12	22	20450.2	expand
13	23	20450.2	reflect
14	24	20450.2	reflect
15	26	17672.6	expand
16	27	17672.6	reflect
17	29	14867.7	expand
18	30	14867.7	reflect
19	31	14867.7	reflect
20	33	9285.29	expand
21	34	9285.29	reflect
22	35	9285.29	reflect
23	37	6741.05	reflect
24	39	6322.73	reflect
25	41	4245.76	reflect
26	43	4245.76	contract inside
27	45	4233.18	reflect
28	46	4233.18	reflect
29	48	4233.18	contract inside
30	50	4233.18	contract inside
31	51	4233.18	reflect
32	53	4233.18	contract inside
33	55	4233.18	contract inside
34	57	4233.18	contract inside
35	59	4204.62	contract outside

36	61	4204.62	contract inside
37	63	4204.62	contract inside
38	65	4204.62	contract inside
39	67	4204.62	contract inside
40	69	4204.62	contract inside
41	70	4204.62	reflect
42	72	4204.62	contract inside
43	74	4196.49	contract inside
44	75	4196.49	reflect
45	77	4196.49	contract inside
46	79	4166.04	reflect
47	81	4166.04	contract inside
48	82	4166.04	reflect
49	84	4138.2	expand
50	85	4138.2	reflect
51	87	4103.32	expand
52	88	4103.32	reflect
53	89	4103.32	reflect
54	91	4078.98	expand
55	93	4060.16	reflect
56	95	3991.47	expand
57	96	3991.47	reflect
58	98	3911.47	expand
59	99	3911.47	reflect
60	101	3837.04	expand
61	102	3837.04	reflect
62	103	3837.04	reflect
63	105	3780.93	expand
64	106	3780.93	reflect
65	108	3695.21	expand
66	109	3695.21	reflect
67	111	3675.31	reflect
68	113	3675.31	contract inside
69	115	3673.56	reflect
70	116	3673.56	reflect
71	118	3673.56	contract inside
72	120	3673.56	contract inside
73	121	3673.56	reflect
74	123	3673.56	contract inside
75	124	3673.56	reflect
76	126	3673.56	contract inside
77	128	3673.56	contract inside
78	130	3673.56	contract inside
79	132	3670.91	reflect
80	134	3663.46	reflect
81	136	3659.96	reflect
82	137	3659.96	reflect
83	138	3659.96	reflect
84	140	3656.16	reflect
85	142	3635.18	expand
86	143	3635.18	reflect
87	144	3635.18	reflect
88	145	3635.18	reflect
89	146	3635.18	reflect

90	148	3620.43	expand
91	150	3620.43	contract inside
92	151	3620.43	reflect
93	153	3584.25	expand
94	154	3584.25	reflect
95	155	3584.25	reflect
96	156	3584.25	reflect
97	158	3533.48	expand
98	159	3533.48	reflect
99	161	3501.42	expand
100	162	3501.42	reflect
101	163	3501.42	reflect
102	164	3501.42	reflect
103	166	3457.04	expand
104	168	3366.67	expand
105	169	3366.67	reflect
106	170	3366.67	reflect
107	171	3366.67	reflect
108	173	3362.22	reflect
109	174	3362.22	reflect
110	176	3362.22	contract outside
111	178	3357.69	reflect
112	180	3285.94	expand
113	181	3285.94	reflect
114	183	3285.94	contract inside
115	185	3241.89	expand
116	186	3241.89	reflect
117	188	3212.22	expand
118	189	3212.22	reflect
119	190	3212.22	reflect
120	191	3212.22	reflect
121	192	3212.22	reflect
122	194	3188.28	reflect
123	195	3188.28	reflect
124	197	3188.28	contract inside
125	199	3188.28	contract inside
126	200	3188.28	reflect
127	201	3188.28	reflect
128	203	3178.57	expand
129	205	3178.57	contract inside
130	207	3155.09	expand
131	208	3155.09	reflect
132	209	3155.09	reflect
133	211	3152.35	reflect
134	212	3152.35	reflect
135	214	3094.85	expand
136	215	3094.85	reflect
137	216	3094.85	reflect
138	217	3094.85	reflect
139	218	3094.85	reflect
140	219	3094.85	reflect
141	221	3060.87	expand
142	223	3014.27	expand
143	224	3014.27	reflect

144	225	3014.27	reflect
145	226	3014.27	reflect
146	227	3014.27	reflect
147	229	2923.3	expand
148	230	2923.3	reflect
149	231	2923.3	reflect
150	232	2923.3	reflect
151	234	2869.29	expand
152	235	2869.29	reflect
153	237	2816.29	reflect
154	239	2771.71	expand
155	241	2771.71	contract outside
156	242	2771.71	reflect
157	243	2771.71	reflect
158	244	2771.71	reflect
159	246	2764	reflect
160	248	2659.35	expand
161	249	2659.35	reflect
162	250	2659.35	reflect
163	251	2659.35	reflect
164	253	2573.23	expand
165	254	2573.23	reflect
166	255	2573.23	reflect
167	256	2573.23	reflect
168	258	2539.7	reflect
169	259	2539.7	reflect
170	260	2539.7	reflect
171	262	2520.65	reflect
172	264	2520.65	contract inside
173	265	2520.65	reflect
174	266	2520.65	reflect
175	267	2520.65	reflect
176	269	2520.65	contract inside
177	270	2520.65	reflect
178	271	2520.65	reflect
179	273	2515.55	contract inside
180	274	2515.55	reflect
181	275	2515.55	reflect
182	276	2515.55	reflect
183	278	2501.94	contract inside
184	280	2501.94	contract inside
185	282	2501.94	contract inside
186	283	2501.94	reflect
187	285	2501.94	contract inside
188	287	2498.92	contract inside
189	288	2498.92	reflect
190	290	2497.58	contract inside
191	292	2497.58	contract inside
192	293	2497.58	reflect
193	295	2496.3	contract inside
194	296	2496.3	reflect
195	297	2496.3	reflect
196	299	2495.58	contract inside
197	301	2490.92	expand

198	302	2490.92	reflect
199	303	2490.92	reflect
200	304	2490.92	reflect
201	306	2490.92	contract inside
202	308	2487.74	expand
203	309	2487.74	reflect
204	311	2487.43	reflect
205	313	2487.11	reflect
206	314	2487.11	reflect
207	316	2480.95	expand
208	318	2475.92	expand
209	319	2475.92	reflect
210	321	2474.35	expand
211	323	2468.32	expand
212	325	2467.86	reflect
213	327	2456.32	expand
214	329	2439.35	expand
215	330	2439.35	reflect
216	331	2439.35	reflect
217	333	2423.32	expand
218	335	2391.74	expand
219	337	2369	expand
220	338	2369	reflect
221	340	2348.82	expand
222	342	2336.5	expand
223	344	2312.87	expand
224	346	2160.86	expand
225	347	2160.86	reflect
226	348	2160.86	reflect
227	349	2160.86	reflect
228	350	2160.86	reflect
229	351	2160.86	reflect
230	352	2160.86	reflect
231	353	2160.86	reflect
232	355	2034.09	expand
233	356	2034.09	reflect
234	358	1904.91	expand
235	359	1904.91	reflect
236	361	1836.91	expand
237	362	1836.91	reflect
238	364	1729.41	expand
239	365	1729.41	reflect
240	367	1680.58	reflect
241	368	1680.58	reflect
242	370	1680.58	contract inside
243	372	1639.52	reflect
244	374	1639.52	contract inside
245	376	1639.52	contract inside
246	377	1639.52	reflect
247	379	1605.01	reflect
248	381	1605.01	contract inside
249	382	1605.01	reflect
250	384	1560.45	reflect
251	385	1560.45	reflect

252	387	1560.45	contract inside
253	389	1560.45	contract inside
254	390	1560.45	reflect
255	391	1560.45	reflect
256	392	1560.45	reflect
257	394	1543.81	reflect
258	395	1543.81	reflect
259	397	1533.17	reflect
260	398	1533.17	reflect
261	399	1533.17	reflect
262	400	1533.17	reflect
263	402	1533.17	contract inside
264	404	1522.25	reflect
265	405	1522.25	reflect
266	407	1522.25	contract inside
267	409	1494.01	expand
268	411	1494.01	contract inside
269	413	1494.01	contract inside
270	414	1494.01	reflect
271	416	1494.01	contract inside
272	417	1494.01	reflect
273	419	1492.33	reflect
274	420	1492.33	reflect
275	422	1492.33	contract inside
276	423	1492.33	reflect
277	424	1492.33	reflect
278	426	1492.33	contract inside
279	428	1492.33	contract inside
280	430	1490.62	reflect
281	432	1490.62	contract inside
282	433	1490.62	reflect
283	434	1490.62	reflect
284	436	1490.62	contract inside
285	438	1490.62	contract inside
286	439	1490.62	reflect
287	440	1490.62	reflect
288	442	1490.28	contract inside
289	444	1490.14	contract inside
290	446	1489.99	contract outside
291	448	1489.84	contract inside
292	450	1489.77	reflect
293	452	1489.68	contract inside
294	454	1489.32	contract inside
295	455	1489.32	reflect
296	457	1489.3	contract inside
297	458	1489.3	reflect
298	460	1489.15	contract inside
299	462	1489.15	contract inside
300	463	1489.15	reflect
301	465	1489.15	contract inside
302	467	1489.13	contract inside
303	469	1489.1	contract inside
304	470	1489.1	reflect
305	472	1489.07	contract inside

306	474	1489.06	contract inside
307	476	1489.05	contract inside
308	478	1489.04	contract inside
309	480	1489.04	contract inside
310	482	1489.04	contract inside
311	483	1489.04	reflect
312	485	1489.02	contract inside
313	487	1489.02	contract inside
314	489	1489.02	contract inside
315	491	1489.02	contract inside
316	493	1489.02	contract inside
317	495	1489.02	contract inside
318	497	1489.01	contract inside
319	499	1489.01	contract inside
320	501	1489.01	contract outside
321	502	1489.01	reflect
322	504	1489.01	contract inside
323	506	1489.01	contract inside
324	507	1489.01	reflect
325	509	1489.01	contract inside
326	510	1489.01	reflect
327	512	1489.01	contract inside
328	514	1489.01	contract inside
329	515	1489.01	reflect
330	516	1489.01	reflect
331	518	1489.01	contract inside
332	520	1489.01	reflect
333	521	1489.01	reflect
334	523	1489.01	contract inside
335	525	1489.01	contract outside
336	527	1489.01	contract inside
337	529	1489.01	contract inside
338	530	1489.01	reflect
339	532	1489.01	contract inside
340	533	1489.01	reflect
341	535	1489.01	reflect
342	536	1489.01	reflect
343	538	1489.01	contract inside
344	540	1489.01	contract inside
345	542	1489.01	contract inside
346	543	1489.01	reflect
347	545	1489.01	contract inside
348	547	1489.01	reflect
349	548	1489.01	reflect
350	550	1489.01	contract inside
351	552	1489.01	contract inside
352	554	1489.01	contract inside
353	556	1489.01	reflect
354	558	1489.01	contract inside
355	560	1489.01	reflect
356	562	1489.01	reflect
357	564	1489.01	reflect
358	566	1489.01	reflect
359	568	1489.01	contract inside

360	569	1489.01	reflect
361	571	1489.01	expand
362	573	1489.01	contract inside
363	574	1489.01	reflect
364	576	1489.01	expand
365	577	1489.01	reflect
366	578	1489.01	reflect
367	580	1489.01	reflect
368	582	1489.01	reflect
369	584	1489.01	expand
370	585	1489.01	reflect
371	587	1489.01	expand
372	588	1489.01	reflect
373	590	1489.01	expand
374	592	1489.01	expand
375	594	1489.01	expand
376	595	1489.01	reflect
377	596	1489.01	reflect
378	598	1489	expand
379	599	1489	reflect
380	600	1489	reflect
381	601	1489	reflect
382	603	1489	expand
383	604	1489	reflect
384	605	1489	reflect
385	607	1489	expand
386	608	1489	reflect
387	609	1489	reflect
388	610	1489	reflect
389	612	1489	expand
390	614	1489	expand
391	615	1489	reflect
392	617	1489	expand
393	619	1489	expand
394	620	1489	reflect
395	622	1488.99	expand
396	624	1488.99	expand
397	625	1488.99	reflect
398	626	1488.99	reflect
399	628	1488.99	expand
400	630	1488.98	expand
401	632	1488.98	expand
402	634	1488.97	expand
403	635	1488.97	reflect
404	636	1488.97	reflect
405	637	1488.97	reflect
406	639	1488.95	expand
407	640	1488.95	reflect
408	641	1488.95	reflect
409	642	1488.95	reflect
410	644	1488.94	expand
411	646	1488.92	expand
412	647	1488.92	reflect
413	648	1488.92	reflect

414	649	1488.92	reflect
415	650	1488.92	reflect
416	651	1488.92	reflect
417	652	1488.92	reflect
418	654	1488.9	expand
419	656	1488.88	expand
420	657	1488.88	reflect
421	658	1488.88	reflect
422	660	1488.87	expand
423	661	1488.87	reflect
424	663	1488.84	expand
425	665	1488.81	expand
426	666	1488.81	reflect
427	667	1488.81	reflect
428	669	1488.81	reflect
429	671	1488.75	expand
430	672	1488.75	reflect
431	673	1488.75	reflect
432	675	1488.75	reflect
433	677	1488.7	expand
434	678	1488.7	reflect
435	679	1488.7	reflect
436	680	1488.7	reflect
437	682	1488.7	reflect
438	683	1488.7	reflect
439	684	1488.7	reflect
440	686	1488.7	contract outside
441	688	1488.69	reflect
442	689	1488.69	reflect
443	690	1488.69	reflect
444	692	1488.67	expand
445	693	1488.67	reflect
446	694	1488.67	reflect
447	696	1488.66	reflect
448	698	1488.61	expand
449	699	1488.61	reflect
450	700	1488.61	reflect
451	702	1488.58	expand
452	703	1488.58	reflect
453	705	1488.53	expand
454	706	1488.53	reflect
455	707	1488.53	reflect
456	709	1488.39	expand
457	710	1488.39	reflect
458	711	1488.39	reflect
459	712	1488.39	reflect
460	713	1488.39	reflect
461	714	1488.39	reflect
462	716	1488.33	reflect
463	718	1488.12	expand
464	719	1488.12	reflect
465	720	1488.12	reflect
466	721	1488.12	reflect
467	722	1488.12	reflect

468	723	1488.12	reflect
469	725	1488.12	reflect
470	726	1488.12	reflect
471	728	1488.03	expand
472	730	1487.73	expand
473	731	1487.73	reflect
474	732	1487.73	reflect
475	733	1487.73	reflect
476	734	1487.73	reflect
477	735	1487.73	reflect
478	737	1487.29	expand
479	738	1487.29	reflect
480	739	1487.29	reflect
481	740	1487.29	reflect
482	741	1487.29	reflect
483	742	1487.29	reflect
484	744	1486.7	expand
485	745	1486.7	reflect
486	746	1486.7	reflect
487	747	1486.7	reflect
488	748	1486.7	reflect
489	750	1486.33	expand
490	752	1485.96	expand
491	753	1485.96	reflect
492	755	1485.55	expand
493	756	1485.55	reflect
494	757	1485.55	reflect
495	758	1485.55	reflect
496	760	1485.42	reflect
497	761	1485.42	reflect
498	763	1485.36	reflect
499	764	1485.36	reflect
500	766	1484.94	expand
501	767	1484.94	reflect
502	769	1484.94	contract inside
503	771	1484.78	expand
504	772	1484.78	reflect
505	773	1484.78	reflect
506	775	1484.25	expand
507	776	1484.25	reflect
508	778	1483.87	expand
509	780	1483.02	expand
510	781	1483.02	reflect
511	782	1483.02	reflect
512	783	1483.02	reflect
513	785	1482.53	expand
514	787	1481.56	expand
515	788	1481.56	reflect
516	790	1480.52	expand
517	792	1479.43	expand
518	794	1477.5	expand
519	795	1477.5	reflect
520	797	1475.31	expand
521	798	1475.31	reflect

522	800	1473.47	expand
523	801	1473.47	reflect
524	803	1465.87	expand
525	804	1465.87	reflect
526	805	1465.87	reflect
527	806	1465.87	reflect
528	808	1462.5	expand
529	810	1461.93	reflect
530	812	1451.22	expand
531	813	1451.22	reflect
532	814	1451.22	reflect
533	815	1451.22	reflect
534	817	1448.99	reflect
535	819	1439.42	expand
536	820	1439.42	reflect
537	821	1439.42	reflect
538	823	1434	expand
539	824	1434	reflect
540	826	1432.13	reflect
541	828	1432.02	reflect
542	829	1432.02	reflect
543	830	1432.02	reflect
544	832	1432.02	contract outside
545	834	1429.59	reflect
546	835	1429.59	reflect
547	837	1429.59	contract inside
548	839	1427.86	reflect
549	840	1427.86	reflect
550	842	1427.86	contract inside
551	843	1427.86	reflect
552	845	1427.86	contract outside
553	846	1427.86	reflect
554	848	1427.86	contract inside
555	850	1427.86	contract inside
556	851	1427.86	reflect
557	853	1427.86	contract outside
558	855	1427.44	reflect
559	856	1427.44	reflect
560	858	1427.44	contract inside
561	859	1427.44	reflect
562	861	1427.3	contract inside
563	863	1427.3	contract inside
564	864	1427.3	reflect
565	866	1427.3	contract inside
566	868	1427.3	contract outside
567	870	1427.3	contract inside
568	872	1427.27	reflect
569	874	1427.22	contract inside
570	876	1427.17	reflect
571	878	1427.14	reflect
572	879	1427.14	reflect
573	881	1427.14	contract inside
574	883	1427.13	contract inside
575	885	1427.13	contract inside

576	886	1427.13	reflect
577	887	1427.13	reflect
578	888	1427.13	reflect
579	890	1427.09	contract inside
580	892	1427.09	contract inside
581	893	1427.09	reflect
582	895	1427.08	contract inside
583	897	1427.08	contract inside
584	898	1427.08	reflect
585	900	1427.07	contract outside
586	902	1427.07	contract inside
587	903	1427.07	reflect
588	905	1427.07	contract inside
589	907	1427.06	contract inside
590	908	1427.06	reflect
591	910	1427.05	reflect
592	911	1427.05	reflect
593	913	1427.05	contract inside
594	915	1427.05	contract outside
595	916	1427.05	reflect
596	918	1427.05	contract outside
597	919	1427.05	reflect
598	920	1427.05	reflect
599	922	1427.05	reflect
600	923	1427.05	reflect
601	924	1427.05	reflect
602	926	1427.05	reflect
603	927	1427.05	reflect
604	929	1427.04	reflect
605	930	1427.04	reflect
606	931	1427.04	reflect
607	933	1427.04	reflect
608	934	1427.04	reflect
609	935	1427.04	reflect
610	936	1427.04	reflect
611	938	1427.04	contract inside
612	940	1427.04	contract outside
613	942	1427.04	contract inside
614	944	1427.04	contract inside
615	946	1427.04	contract inside
616	948	1427.04	reflect
617	950	1427.04	contract inside
618	951	1427.04	reflect
619	953	1427.04	reflect
620	954	1427.04	reflect
621	956	1427.04	contract inside
622	957	1427.04	reflect
623	958	1427.04	reflect
624	960	1427.04	contract inside
625	961	1427.04	reflect
626	962	1427.04	reflect
627	964	1427.04	reflect
628	966	1427.04	contract outside
629	968	1427.04	contract inside

```
630         970         1427.04         contract inside
631         972         1427.04         contract inside
632         974         1427.04         contract outside
633         976         1427.04         contract inside
634         977         1427.04         reflect
635         979         1427.04         contract inside
636         981         1427.04         contract inside
637         982         1427.04         reflect
638         983         1427.04         reflect
639         985         1427.04         contract inside
640         987         1427.04         contract inside
641         989         1427.04         contract inside
642         991         1427.04         contract inside
643         992         1427.04         reflect
644         993         1427.04         reflect
645         995         1427.04         contract inside
646         997         1427.04         contract inside
647         998         1427.04         reflect
648         999         1427.04         reflect
649         1000        1427.04         reflect
650         1002        1427.04         reflect
651         1003        1427.04         reflect
652         1005        1427.04         contract inside
653         1007        1427.04         contract inside
654         1009        1427.04         contract inside
655         1011        1427.04         contract outside
656         1013        1427.04         contract inside
657         1015        1427.04         contract inside
658         1017        1427.04         reflect
659         1019        1427.04         contract inside
660         1021        1427.04         contract inside
661         1022        1427.04         reflect
662         1024        1427.04         contract inside
663         1026        1427.04         contract inside
664         1028        1427.04         contract inside
665         1029        1427.04         reflect
666         1031        1427.04         contract inside
667         1033        1427.04         contract inside
668         1034        1427.04         reflect
669         1036        1427.04         contract inside
670         1038        1427.04         contract inside
671         1039        1427.04         reflect
672         1041        1427.04         contract inside
673         1043        1427.04         contract inside
674         1044        1427.04         reflect
675         1046        1427.04         contract inside

Optimization terminated:
 the current x satisfies the termination criteria using OPTIONS.TolX
 of 1.000000e-04
 and F(X) satisfies the convergence criteria using OPTIONS.TolFun of
 1.000000e-04


                                                    First-order
```

Iteration	Func-count	f(x)	Step-size	optimality
0	7	25833.5		3.02e+04
1	35	3407.57	2.20111e-05	2.53e+04
2	91	2652.29	0.0102531	2.92e+03
3	98	2151.33	1	3.48e+04
4	105	1608.06	1	962
5	112	1546.11	1	1.7e+03
6	126	1537.04	0.499238	1.34e+03
7	133	1534.3	1	230
8	140	1531.82	1	253
9	147	1526.32	1	871
10	154	1524.41	1	826
11	161	1519.56	1	285
12	168	1513.91	1	534
13	175	1503.63	1	1.89e+03
14	182	1486.99	1	3.36e+03
15	189	1461.85	1	4.24e+03
16	196	1439.92	1	3.09e+03
17	203	1429.05	1	961
18	210	1427.28	1	88.1
19	217	1427.12	1	86.8

Iteration	Func-count	f(x)	Step-size	First-order optimality
20	224	1427.07	1	90.2
21	231	1427.04	1	41.4
22	238	1427.04	1	5.76
23	245	1427.04	1	0.289
24	252	1427.04	1	0.328
25	259	1427.04	1	0.00771

Local minimum found.

Optimization completed because the size of the gradient is less than the value of the optimality tolerance.

Iteration	Func-count	f(x)	Norm of step	First-order optimality
0	7	7803		0.00083

Objective function returned Inf; trying a new point...

Iteration	Func-count	f(x)	Norm of step	First-order optimality
1	14	7803	10	0.00083
2	21	7801.71	0.5	13.5
3	28	7801.71	1	13.5
4	35	7801.71	0.25	13.5
5	42	7797.83	0.0625	57.9
6	49	7724.03	0.125	232
7	56	7632.54	0.25	755
8	63	7279.65	0.5	4.3e+03
9	70	6118.48	1	2.97e+03
10	77	5741.26	1.65747	2.8e+04
11	84	5540.3	0.228829	2.58e+03
12	91	5537.84	0.0306662	37.1
13	98	5537.84	0.00108317	1.61

Local minimum possible.

lsqnonlin stopped because the final change in the sum of squares relative to
its initial value is less than the value of the function tolerance.

Iteration	Func-count	min f(x)	Procedure
0	1	7803	
1	7	7803	initial simplex
2	9	7803	expand
3	10	7803	reflect
4	11	7803	reflect
5	12	7803	reflect
6	13	7803	reflect
7	15	7803	expand
8	16	7803	reflect
9	18	7803	expand
10	19	7803	reflect
11	21	7803	expand
12	22	7803	reflect
13	24	7802.99	expand
14	25	7802.99	reflect
15	27	7802.95	expand
16	28	7802.95	reflect
17	30	7802.02	expand
18	31	7802.02	reflect
19	33	7801.51	reflect
20	35	7798.02	reflect
21	37	7778.31	reflect
22	39	7778.31	contract inside
23	41	7758.14	reflect
24	43	7758.14	contract inside
25	44	7758.14	reflect
26	46	7758.14	contract inside
27	48	7758.14	contract inside
28	50	7758.14	contract inside
29	51	7758.14	reflect
30	53	7758.14	contract inside
31	55	7758.14	contract inside
32	57	7758.14	contract inside
33	59	7758.14	contract inside
34	61	7758.14	contract inside
35	63	7758.14	contract inside
36	64	7758.14	reflect
37	66	7758.14	contract inside
38	68	7758.14	contract inside
39	69	7758.14	reflect
40	71	7758.14	contract inside
41	73	7758.14	contract inside
42	75	7758.14	contract inside
43	76	7758.14	reflect
44	78	7758.14	contract inside
45	79	7758.14	reflect

46	80	7758.14	reflect
47	82	7758.14	contract inside
48	84	7758.14	contract inside
49	86	7758.14	contract inside
50	88	7758.14	contract inside
51	89	7758.14	reflect
52	91	7758.14	contract outside
53	92	7758.14	reflect
54	94	7758.14	contract inside
55	96	7756.15	reflect
56	98	7756.15	contract inside
57	100	7756.15	contract inside
58	102	7755.89	expand
59	103	7755.89	reflect
60	105	7751.34	expand
61	106	7751.34	reflect
62	108	7751.34	contract inside
63	109	7751.34	reflect
64	110	7751.34	reflect
65	111	7751.34	reflect
66	113	7748.75	expand
67	114	7748.75	reflect
68	116	7745.53	expand
69	118	7737.84	expand
70	119	7737.84	reflect
71	120	7737.84	reflect
72	122	7737.68	reflect
73	124	7721	expand
74	125	7721	reflect
75	126	7721	reflect
76	128	7696.63	expand
77	129	7696.63	reflect
78	130	7696.63	reflect
79	131	7696.63	reflect
80	133	7671.19	expand
81	135	7671.19	contract inside
82	136	7671.19	reflect
83	137	7671.19	reflect
84	139	7658.8	expand
85	140	7658.8	reflect
86	142	7635.86	expand
87	143	7635.86	reflect
88	144	7635.86	reflect
89	146	7635.86	contract outside
90	147	7635.86	reflect
91	149	7635.86	contract outside
92	151	7635.86	contract inside
93	152	7635.86	reflect
94	154	7632.21	reflect
95	156	7632.21	contract inside
96	158	7632.21	contract inside
97	159	7632.21	reflect
98	161	7629.67	reflect
99	162	7629.67	reflect

```
100        163        7629.67        reflect
101        164        7629.67        reflect
102        165        7629.67        reflect
103        167        7629.67        contract outside
104        169        7628.99        contract outside
105        171        7628.99        contract outside
106        173        7627.14        reflect
107        175        7623.71        expand
108        177        7623.71        contract inside
109        178        7623.71        reflect
110        179        7623.71        reflect
111        181        7619.73        expand
112        182        7619.73        reflect
113        184        7613.67        expand
114        185        7613.67        reflect
115        187        7604.14        expand
116        188        7604.14        reflect
117        189        7604.14        reflect
118        190        7604.14        reflect
119        192        7587.48        expand
120        193        7587.48        reflect
121        195        7574.75        expand
122        196        7574.75        reflect
123        197        7574.75        reflect
124        198        7574.75        reflect
125        199        7574.75        reflect
126        201        7538.36        expand
127        202        7538.36        reflect
128        203        7538.36        reflect
129        205        7538.36        contract inside
130        206        7538.36        reflect
131        207        7538.36        reflect
132        208        7538.36        reflect
133        210        7500.55        expand
134        211        7500.55        reflect
135        212        7500.55        reflect
136        213        7500.55        reflect
137        215        7499.29        reflect
138        217        7499.29        contract inside
139        219        7446.85        expand
140        220        7446.85        reflect
141        221        7446.85        reflect
142        223        7413.91        expand
143        224        7413.91        reflect
144        226        7357.67        expand
145        228        7267.18        expand
146        230        7267.18        contract outside
147        231        7267.18        reflect
148        233        7163.42        expand
149        235        7134.12        reflect
150        237        6913.76        expand
151        238        6913.76        reflect
152        240        6913.76        contract outside
153        241        6913.76        reflect
```

154	242	6913.76	reflect
155	243	6913.76	reflect
156	244	6913.76	reflect
157	246	6803.77	reflect
158	248	6803.77	contract inside
159	250	6723.15	reflect
160	251	6723.15	reflect
161	253	6723.15	contract inside
162	254	6723.15	reflect
163	255	6723.15	reflect
164	257	6723.15	contract inside
165	259	6618.3	expand
166	260	6618.3	reflect
167	261	6618.3	reflect
168	263	6618.3	contract inside
169	264	6618.3	reflect
170	265	6618.3	reflect
171	267	6618.3	contract inside
172	268	6618.3	reflect
173	270	6586.22	reflect
174	271	6586.22	reflect
175	273	6544.19	reflect
176	275	6544.19	contract inside
177	276	6544.19	reflect
178	278	6530.47	expand
179	280	6530.47	contract inside
180	281	6530.47	reflect
181	282	6530.47	reflect
182	284	6529.44	reflect
183	285	6529.44	reflect
184	286	6529.44	reflect
185	288	6529.44	contract inside
186	289	6529.44	reflect
187	291	6529.44	contract inside
188	293	6529.44	contract inside
189	294	6529.44	reflect
190	296	6529.44	contract inside
191	298	6529.44	contract outside
192	300	6529.36	contract inside
193	302	6529.13	contract inside
194	304	6528.61	contract inside
195	306	6528.11	contract inside
196	307	6528.11	reflect
197	309	6528.04	contract inside
198	311	6528.04	contract inside
199	312	6528.04	reflect
200	313	6528.04	reflect
201	315	6527.91	contract inside
202	317	6526.4	expand
203	319	6526.4	contract inside
204	320	6526.4	reflect
205	321	6526.4	reflect
206	322	6526.4	reflect
207	323	6526.4	reflect

208	324	6526.4	reflect
209	326	6523.75	expand
210	327	6523.75	reflect
211	328	6523.75	reflect
212	329	6523.75	reflect
213	330	6523.75	reflect
214	332	6523.75	contract inside
215	333	6523.75	reflect
216	334	6523.75	reflect
217	336	6522.98	expand
218	337	6522.98	reflect
219	339	6522.86	reflect
220	341	6519.66	expand
221	343	6517.01	expand
222	344	6517.01	reflect
223	345	6517.01	reflect
224	346	6517.01	reflect
225	348	6514.31	expand
226	350	6506.74	expand
227	351	6506.74	reflect
228	352	6506.74	reflect
229	354	6501.63	expand
230	355	6501.63	reflect
231	357	6495.53	expand
232	358	6495.53	reflect
233	359	6495.53	reflect
234	360	6495.53	reflect
235	362	6495.45	reflect
236	364	6486.93	expand
237	366	6486.93	contract outside
238	368	6482.6	expand
239	370	6482.6	contract inside
240	371	6482.6	reflect
241	372	6482.6	reflect
242	373	6482.6	reflect
243	375	6481.53	reflect
244	377	6481.53	contract outside
245	379	6481.15	reflect
246	380	6481.15	reflect
247	381	6481.15	reflect
248	382	6481.15	reflect
249	384	6480.96	reflect
250	386	6480.96	contract inside
251	388	6480.87	contract outside
252	389	6480.87	reflect
253	391	6480.77	reflect
254	393	6480.42	contract inside
255	394	6480.42	reflect
256	396	6480.2	contract inside
257	398	6480.2	contract inside
258	399	6480.2	reflect
259	401	6480.2	contract inside
260	403	6480.2	contract inside
261	405	6480.2	contract outside

262	407	6480.15	contract inside
263	408	6480.15	reflect
264	409	6480.15	reflect
265	411	6480.13	contract inside
266	412	6480.13	reflect
267	414	6480.11	contract inside
268	416	6480.11	contract inside
269	418	6480.09	contract inside
270	420	6480.09	contract inside
271	422	6480.09	contract inside
272	424	6480.09	contract inside
273	426	6480.08	reflect
274	427	6480.08	reflect
275	429	6480.07	contract inside
276	431	6480.07	contract inside
277	433	6480.07	contract inside
278	435	6480.07	contract inside
279	437	6480.06	reflect
280	439	6480.06	reflect
281	441	6480.06	contract inside
282	442	6480.06	reflect
283	444	6480.03	expand
284	445	6480.03	reflect
285	446	6480.03	reflect
286	447	6480.03	reflect
287	449	6480.03	contract inside
288	451	6480	expand
289	452	6480	reflect
290	453	6480	reflect
291	454	6480	reflect
292	456	6479.97	expand
293	457	6479.97	reflect
294	459	6479.92	expand
295	460	6479.92	reflect
296	461	6479.92	reflect
297	463	6479.86	expand
298	465	6479.82	expand
299	467	6479.74	expand
300	468	6479.74	reflect
301	469	6479.74	reflect
302	471	6479.62	expand
303	473	6479.5	expand
304	475	6479.3	expand
305	476	6479.3	reflect
306	477	6479.3	reflect
307	479	6478.91	expand
308	480	6478.91	reflect
309	481	6478.91	reflect
310	483	6478.69	expand
311	485	6478.23	expand
312	486	6478.23	reflect
313	488	6477.98	expand
314	490	6477.44	expand
315	491	6477.44	reflect

316	*493*	*6477.01*	*expand*
317	*495*	*6475.87*	*expand*
318	*496*	*6475.87*	*reflect*
319	*497*	*6475.87*	*reflect*
320	*498*	*6475.87*	*reflect*
321	*500*	*6475.24*	*expand*
322	*501*	*6475.24*	*reflect*
323	*503*	*6474.05*	*expand*
324	*504*	*6474.05*	*reflect*
325	*506*	*6473.2*	*expand*
326	*507*	*6473.2*	*reflect*
327	*509*	*6470.56*	*expand*
328	*510*	*6470.56*	*reflect*
329	*512*	*6466.8*	*expand*
330	*513*	*6466.8*	*reflect*
331	*514*	*6466.8*	*reflect*
332	*515*	*6466.8*	*reflect*
333	*517*	*6459.37*	*expand*
334	*518*	*6459.37*	*reflect*
335	*519*	*6459.37*	*reflect*
336	*520*	*6459.37*	*reflect*
337	*522*	*6451.61*	*expand*
338	*523*	*6451.61*	*reflect*
339	*525*	*6442.31*	*expand*
340	*526*	*6442.31*	*reflect*
341	*527*	*6442.31*	*reflect*
342	*529*	*6434.37*	*expand*
343	*531*	*6414.52*	*expand*
344	*532*	*6414.52*	*reflect*
345	*533*	*6414.52*	*reflect*
346	*534*	*6414.52*	*reflect*
347	*535*	*6414.52*	*reflect*
348	*537*	*6412.94*	*reflect*
349	*539*	*6408.69*	*reflect*
350	*541*	*6402.19*	*expand*
351	*543*	*6382.65*	*expand*
352	*544*	*6382.65*	*reflect*
353	*546*	*6358.71*	*expand*
354	*547*	*6358.71*	*reflect*
355	*548*	*6358.71*	*reflect*
356	*549*	*6358.71*	*reflect*
357	*550*	*6358.71*	*reflect*
358	*552*	*6337.97*	*expand*
359	*553*	*6337.97*	*reflect*
360	*555*	*6327.32*	*expand*
361	*557*	*6287.84*	*expand*
362	*558*	*6287.84*	*reflect*
363	*560*	*6283.62*	*expand*
364	*561*	*6283.62*	*reflect*
365	*562*	*6283.62*	*reflect*
366	*564*	*6259.9*	*reflect*
367	*565*	*6259.9*	*reflect*
368	*567*	*6249.72*	*reflect*
369	*569*	*6247.58*	*reflect*

370	571	6247.58	contract outside
371	573	6231.47	reflect
372	575	6231.47	contract inside
373	577	6227.87	reflect
374	578	6227.87	reflect
375	579	6227.87	reflect
376	581	6208.05	reflect
377	582	6208.05	reflect
378	583	6208.05	reflect
379	584	6208.05	reflect
380	586	6208.05	contract inside
381	587	6208.05	reflect
382	589	6188.87	expand
383	590	6188.87	reflect
384	592	6188.87	contract inside
385	594	6188.87	contract inside
386	595	6188.87	reflect
387	596	6188.87	reflect
388	598	6188.87	contract inside
389	600	6188.87	contract inside
390	601	6188.87	reflect
391	602	6188.87	reflect
392	603	6188.87	reflect
393	604	6188.87	reflect
394	606	6181.57	expand
395	608	6181.57	contract inside
396	609	6181.57	reflect
397	610	6181.57	reflect
398	611	6181.57	reflect
399	613	6177.73	reflect
400	614	6177.73	reflect
401	616	6175.61	reflect
402	618	6175.61	contract inside
403	620	6174.54	reflect
404	621	6174.54	reflect
405	622	6174.54	reflect
406	623	6174.54	reflect
407	625	6174.5	reflect
408	627	6174.5	contract inside
409	629	6173.94	reflect
410	630	6173.94	reflect
411	632	6173.38	contract inside
412	634	6173.38	contract inside
413	636	6173.36	contract inside
414	638	6172.75	reflect
415	640	6172.75	contract inside
416	641	6172.75	reflect
417	643	6172.73	contract inside
418	645	6172.69	contract inside
419	647	6172.6	reflect
420	649	6172.01	reflect
421	651	6172.01	contract inside
422	653	6172.01	contract outside
423	655	6172.01	contract inside

424	657	6171.91	reflect
425	658	6171.91	reflect
426	659	6171.91	reflect
427	661	6171.91	contract inside
428	662	6171.91	reflect
429	663	6171.91	reflect
430	665	6171.82	reflect
431	666	6171.82	reflect
432	667	6171.82	reflect
433	669	6171.82	contract inside
434	671	6171.82	contract inside
435	673	6171.82	contract outside
436	675	6171.67	reflect
437	676	6171.67	reflect
438	678	6171.67	contract inside
439	679	6171.67	reflect
440	681	6171.67	contract outside
441	683	6171.58	expand
442	684	6171.58	reflect
443	686	6171.58	contract inside
444	688	6171.54	reflect
445	690	6171.5	reflect
446	691	6171.5	reflect
447	692	6171.5	reflect
448	693	6171.5	reflect
449	695	6171.5	contract outside
450	697	6171.5	contract inside
451	698	6171.5	reflect
452	699	6171.5	reflect
453	701	6171.49	contract inside
454	703	6171.48	contract inside
455	705	6171.48	contract inside
456	707	6171.48	contract inside
457	709	6171.47	reflect
458	711	6171.47	contract inside
459	713	6171.47	contract inside
460	714	6171.47	reflect
461	716	6171.46	reflect
462	718	6171.46	contract inside
463	719	6171.46	reflect
464	721	6171.46	contract inside
465	723	6171.46	contract inside
466	724	6171.46	reflect
467	726	6171.46	contract inside
468	728	6171.46	contract inside
469	729	6171.46	reflect
470	731	6171.46	reflect
471	733	6171.46	expand
472	735	6171.45	reflect
473	736	6171.45	reflect
474	737	6171.45	reflect
475	738	6171.45	reflect
476	739	6171.45	reflect
477	740	6171.45	reflect

```
478        742        6171.45        contract inside
479        744        6171.45        contract outside
480        746        6171.45        contract inside
481        747        6171.45        reflect
482        749        6171.45        contract inside
483        751        6171.45        contract inside
484        753        6171.45        contract inside
485        755        6171.45        contract outside
486        757        6171.45        contract inside
487        759        6171.45        contract inside
488        761        6171.45        contract inside
489        763        6171.45        contract inside
490        765        6171.45        reflect
491        766        6171.45        reflect
492        768        6171.45        contract inside
493        770        6171.45        contract inside
494        772        6171.45        contract outside
495        773        6171.45        reflect
496        774        6171.45        reflect
497        775        6171.45        reflect
498        777        6171.45        contract inside
499        779        6171.45        contract outside
500        781        6171.45        contract inside
501        783        6171.45        contract outside
502        785        6171.45        contract outside
503        786        6171.45        reflect
504        788        6171.45        contract inside
505        789        6171.45        reflect
506        791        6171.45        contract inside
507        792        6171.45        reflect
508        794        6171.45        contract outside
509        796        6171.45        contract inside
510        797        6171.45        reflect
511        799        6171.45        contract inside
512        801        6171.45        contract inside
513        803        6171.45        contract inside
514        805        6171.45        reflect
```

Optimization terminated:
 the current x satisfies the termination criteria using OPTIONS.TolX
 of 1.000000e-04
 and F(X) satisfies the convergence criteria using OPTIONS.TolFun of
 1.000000e-04

```
Iteration   Func-count     min f(x)        Procedure
    0            1          357225
    1            7          357225        initial simplex
    2            9          239812        expand
    3           10          239812        reflect
    4           11          239812        reflect
    5           12          239812        reflect
    6           13          239812        reflect
    7           15          174407        expand
```

8	16	174407	reflect
9	17	174407	reflect
10	19	110961	expand
11	20	110961	reflect
12	22	69632.2	expand
13	23	69632.2	reflect
14	24	69632.2	reflect
15	26	31096.2	expand
16	27	31096.2	reflect
17	29	14246.1	expand
18	30	14246.1	reflect
19	31	14246.1	reflect
20	33	3567.92	expand
21	34	3567.92	reflect
22	35	3567.92	reflect
23	37	1844.78	expand
24	38	1844.78	reflect
25	40	1837.43	reflect
26	41	1837.43	reflect
27	42	1837.43	reflect
28	43	1837.43	reflect
29	45	1837.43	contract outside
30	46	1837.43	reflect
31	48	1837.43	contract outside
32	50	1837.43	contract inside
33	52	1837.43	contract inside
34	54	1837.43	contract inside
35	56	1821.67	contract inside
36	58	1804.27	contract inside
37	60	1801.42	contract inside
38	62	1797.7	contract inside
39	63	1797.7	reflect
40	65	1797.7	contract outside
41	67	1797.7	contract inside
42	69	1796.85	contract inside
43	71	1792.98	reflect
44	72	1792.98	reflect
45	74	1792.98	contract inside
46	75	1792.98	reflect
47	77	1792.98	contract inside
48	78	1792.98	reflect
49	80	1792.98	contract inside
50	82	1792.98	contract inside
51	83	1792.98	reflect
52	85	1792.56	reflect
53	87	1787.42	expand
54	89	1787.42	contract inside
55	90	1787.42	reflect
56	91	1787.42	reflect
57	93	1787.42	contract inside
58	95	1785.63	expand
59	96	1785.63	reflect
60	98	1781.8	expand
61	100	1775.42	expand

62	101	1775.42	reflect
63	103	1775.42	contract inside
64	104	1775.42	reflect
65	106	1769.48	expand
66	107	1769.48	reflect
67	108	1769.48	reflect
68	110	1761.81	expand
69	112	1750.72	expand
70	113	1750.72	reflect
71	115	1739.13	expand
72	116	1739.13	reflect
73	117	1739.13	reflect
74	119	1727.8	expand
75	121	1709.76	expand
76	122	1709.76	reflect
77	124	1697.94	expand
78	125	1697.94	reflect
79	127	1688.7	expand
80	128	1688.7	reflect
81	129	1688.7	reflect
82	130	1688.7	reflect
83	131	1688.7	reflect
84	133	1688.7	contract inside
85	135	1688.7	contract inside
86	137	1688.7	contract inside
87	139	1688.7	contract inside
88	141	1688.7	contract inside
89	143	1688.7	contract inside
90	145	1688.7	contract inside
91	146	1688.7	reflect
92	148	1688.7	contract inside
93	150	1688.7	contract inside
94	152	1688.7	contract inside
95	153	1688.7	reflect
96	154	1688.7	reflect
97	156	1688.7	contract inside
98	158	1688.57	reflect
99	160	1688.47	reflect
100	161	1688.47	reflect
101	162	1688.47	reflect
102	164	1687.97	expand
103	165	1687.97	reflect
104	167	1687.97	contract outside
105	169	1687.18	expand
106	170	1687.18	reflect
107	171	1687.18	reflect
108	172	1687.18	reflect
109	173	1687.18	reflect
110	175	1687.1	reflect
111	176	1687.1	reflect
112	178	1686.78	reflect
113	180	1685.65	expand
114	182	1685.65	contract outside
115	183	1685.65	reflect

116	184	1685.65	reflect
117	186	1685.65	contract inside
118	188	1684.56	expand
119	189	1684.56	reflect
120	190	1684.56	reflect
121	191	1684.56	reflect
122	193	1684.27	expand
123	195	1684.21	reflect
124	197	1684.04	reflect
125	199	1682.96	expand
126	200	1682.96	reflect
127	201	1682.96	reflect
128	202	1682.96	reflect
129	203	1682.96	reflect
130	204	1682.96	reflect
131	206	1682.84	reflect
132	208	1682.56	reflect
133	210	1682.56	contract inside
134	211	1682.56	reflect
135	213	1682.56	contract inside
136	215	1682.56	contract inside
137	216	1682.56	reflect
138	217	1682.56	reflect
139	218	1682.56	reflect
140	219	1682.56	reflect
141	220	1682.56	reflect
142	222	1682.5	reflect
143	223	1682.5	reflect
144	224	1682.5	reflect
145	225	1682.5	reflect
146	227	1682.26	reflect
147	228	1682.26	reflect
148	230	1682.26	contract inside
149	232	1682.25	reflect
150	233	1682.25	reflect
151	234	1682.25	reflect
152	236	1682.11	reflect
153	237	1682.11	reflect
154	239	1682.11	contract inside
155	241	1681.89	expand
156	242	1681.89	reflect
157	243	1681.89	reflect
158	244	1681.89	reflect
159	246	1681.89	reflect
160	248	1681.26	expand
161	249	1681.26	reflect
162	250	1681.26	reflect
163	252	1680.87	expand
164	253	1680.87	reflect
165	254	1680.87	reflect
166	256	1680.51	expand
167	258	1680.28	expand
168	260	1678.98	expand
169	261	1678.98	reflect

170	262	1678.98	reflect
171	263	1678.98	reflect
172	265	1677.86	expand
173	266	1677.86	reflect
174	268	1675.65	expand
175	269	1675.65	reflect
176	270	1675.65	reflect
177	272	1674.04	expand
178	273	1674.04	reflect
179	275	1671.45	expand
180	277	1667.16	expand
181	278	1667.16	reflect
182	279	1667.16	reflect
183	280	1667.16	reflect
184	282	1659	expand
185	283	1659	reflect
186	285	1653.43	expand
187	286	1653.43	reflect
188	287	1653.43	reflect
189	289	1642.49	expand
190	291	1628.43	expand
191	292	1628.43	reflect
192	293	1628.43	reflect
193	294	1628.43	reflect
194	296	1604.74	expand
195	297	1604.74	reflect
196	298	1604.74	reflect
197	300	1576.94	expand
198	301	1576.94	reflect
199	303	1555.99	expand
200	304	1555.99	reflect
201	305	1555.99	reflect
202	307	1518.54	expand
203	308	1518.54	reflect
204	310	1495.2	expand
205	311	1495.2	reflect
206	312	1495.2	reflect
207	314	1489.68	reflect
208	315	1489.68	reflect
209	317	1488.79	reflect
210	318	1488.79	reflect
211	319	1488.79	reflect
212	321	1488.1	contract inside
213	323	1487.63	contract inside
214	324	1487.63	reflect
215	326	1487.23	contract inside
216	328	1486.93	contract inside
217	330	1486.93	contract inside
218	332	1486.65	contract inside
219	334	1486.5	contract outside
220	336	1486.4	contract inside
221	338	1486.25	contract inside
222	340	1485.94	contract inside
223	341	1485.94	reflect

224	*343*	*1485.8*	*contract inside*
225	*344*	*1485.8*	*reflect*
226	*346*	*1485.8*	*contract inside*
227	*348*	*1485.8*	*contract outside*
228	*350*	*1485.8*	*contract inside*
229	*352*	*1485.79*	*contract inside*
230	*354*	*1485.77*	*contract outside*
231	*356*	*1485.73*	*contract outside*
232	*358*	*1485.72*	*contract inside*
233	*360*	*1485.72*	*contract inside*
234	*362*	*1485.62*	*reflect*
235	*364*	*1485.62*	*contract inside*
236	*366*	*1485.62*	*contract inside*
237	*367*	*1485.62*	*reflect*
238	*369*	*1485.62*	*contract inside*
239	*371*	*1485.59*	*expand*
240	*372*	*1485.59*	*reflect*
241	*374*	*1485.52*	*expand*
242	*376*	*1485.51*	*expand*
243	*378*	*1485.47*	*reflect*
244	*380*	*1485.42*	*expand*
245	*381*	*1485.42*	*reflect*
246	*383*	*1485.35*	*reflect*
247	*385*	*1485.31*	*reflect*
248	*387*	*1485.29*	*reflect*
249	*389*	*1485.29*	*contract outside*
250	*390*	*1485.29*	*reflect*
251	*392*	*1485.12*	*expand*
252	*393*	*1485.12*	*reflect*
253	*394*	*1485.12*	*reflect*
254	*395*	*1485.12*	*reflect*
255	*396*	*1485.12*	*reflect*
256	*397*	*1485.12*	*reflect*
257	*398*	*1485.12*	*reflect*
258	*400*	*1485.05*	*reflect*
259	*401*	*1485.05*	*reflect*
260	*402*	*1485.05*	*reflect*
261	*404*	*1485.05*	*contract inside*
262	*405*	*1485.05*	*reflect*
263	*407*	*1485.05*	*contract inside*
264	*409*	*1485.02*	*reflect*
265	*410*	*1485.02*	*reflect*
266	*411*	*1485.02*	*reflect*
267	*413*	*1484.97*	*expand*
268	*414*	*1484.97*	*reflect*
269	*415*	*1484.97*	*reflect*
270	*416*	*1484.97*	*reflect*
271	*417*	*1484.97*	*reflect*
272	*419*	*1484.8*	*expand*
273	*421*	*1484.8*	*contract outside*
274	*422*	*1484.8*	*reflect*
275	*423*	*1484.8*	*reflect*
276	*424*	*1484.8*	*reflect*
277	*425*	*1484.8*	*reflect*

278	426	1484.8	reflect
279	427	1484.8	reflect
280	429	1484.58	expand
281	430	1484.58	reflect
282	431	1484.58	reflect
283	432	1484.58	reflect
284	433	1484.58	reflect
285	435	1484.41	expand
286	437	1484.16	expand
287	438	1484.16	reflect
288	439	1484.16	reflect
289	441	1483.86	expand
290	442	1483.86	reflect
291	444	1483.52	expand
292	445	1483.52	reflect
293	446	1483.52	reflect
294	448	1482.99	expand
295	449	1482.99	reflect
296	450	1482.99	reflect
297	451	1482.99	reflect
298	453	1482.56	expand
299	454	1482.56	reflect
300	455	1482.56	reflect
301	456	1482.56	reflect
302	457	1482.56	reflect
303	458	1482.56	reflect
304	460	1482.5	reflect
305	461	1482.5	reflect
306	462	1482.5	reflect
307	464	1482.47	contract inside
308	465	1482.47	reflect
309	467	1482.42	contract inside
310	469	1482.42	contract inside
311	470	1482.42	reflect
312	471	1482.42	reflect
313	472	1482.42	reflect
314	473	1482.42	reflect
315	475	1482.41	reflect
316	477	1482.4	contract inside
317	479	1482.39	contract inside
318	480	1482.39	reflect
319	481	1482.39	reflect
320	483	1482.39	contract inside
321	485	1482.39	contract inside
322	487	1482.39	contract inside
323	489	1482.38	contract inside
324	491	1482.38	contract inside
325	493	1482.38	contract inside
326	495	1482.38	contract inside
327	497	1482.38	contract inside
328	499	1482.38	contract inside
329	501	1482.38	contract outside
330	503	1482.38	contract inside
331	505	1482.37	contract inside

332	507	1482.37	contract outside
333	508	1482.37	reflect
334	509	1482.37	reflect
335	511	1482.37	contract inside
336	512	1482.37	reflect
337	514	1482.37	contract inside
338	516	1482.37	contract inside
339	518	1482.37	reflect
340	519	1482.37	reflect
341	521	1482.37	contract inside
342	522	1482.37	reflect
343	524	1482.37	contract inside
344	525	1482.37	reflect
345	527	1482.37	contract inside
346	529	1482.37	contract inside
347	530	1482.37	reflect
348	532	1482.37	reflect
349	533	1482.37	reflect
350	535	1482.37	contract inside
351	537	1482.37	reflect
352	539	1482.37	reflect
353	540	1482.37	reflect
354	542	1482.37	reflect
355	544	1482.37	contract inside
356	546	1482.37	contract inside
357	547	1482.37	reflect
358	549	1482.37	contract inside
359	550	1482.37	reflect
360	552	1482.37	reflect
361	554	1482.37	contract inside
362	556	1482.37	contract outside
363	557	1482.37	reflect
364	559	1482.37	expand
365	560	1482.37	reflect
366	562	1482.37	contract inside
367	564	1482.37	contract inside
368	565	1482.37	reflect
369	566	1482.37	reflect
370	567	1482.37	reflect
371	568	1482.37	reflect
372	570	1482.37	expand
373	572	1482.37	expand
374	573	1482.37	reflect
375	574	1482.37	reflect
376	576	1482.37	expand
377	577	1482.37	reflect
378	579	1482.37	expand
379	581	1482.37	expand
380	582	1482.37	reflect
381	584	1482.37	expand
382	586	1482.37	expand
383	587	1482.37	reflect
384	588	1482.37	reflect
385	590	1482.37	expand

386	592	1482.37	reflect
387	593	1482.37	reflect
388	595	1482.37	expand
389	597	1482.37	expand
390	598	1482.37	reflect
391	599	1482.37	reflect
392	600	1482.37	reflect
393	602	1482.37	reflect
394	603	1482.37	reflect
395	605	1482.36	expand
396	607	1482.36	contract inside
397	608	1482.36	reflect
398	609	1482.36	reflect
399	611	1482.36	contract outside
400	613	1482.36	expand
401	615	1482.36	expand
402	616	1482.36	reflect
403	617	1482.36	reflect
404	618	1482.36	reflect
405	620	1482.36	reflect
406	622	1482.36	expand
407	624	1482.35	expand
408	625	1482.35	reflect
409	626	1482.35	reflect
410	627	1482.35	reflect
411	628	1482.35	reflect
412	630	1482.35	reflect
413	632	1482.34	expand
414	633	1482.34	reflect
415	634	1482.34	reflect
416	635	1482.34	reflect
417	637	1482.34	expand
418	638	1482.34	reflect
419	640	1482.33	expand
420	641	1482.33	reflect
421	643	1482.32	expand
422	644	1482.32	reflect
423	646	1482.31	expand
424	647	1482.31	reflect
425	649	1482.3	expand
426	650	1482.3	reflect
427	651	1482.3	reflect
428	653	1482.3	reflect
429	654	1482.3	reflect
430	655	1482.3	reflect
431	656	1482.3	reflect
432	658	1482.29	reflect
433	660	1482.28	expand
434	662	1482.28	contract outside
435	663	1482.28	reflect
436	664	1482.28	reflect
437	665	1482.28	reflect
438	666	1482.28	reflect
439	667	1482.28	reflect

440	669	1482.28	expand
441	671	1482.25	expand
442	672	1482.25	reflect
443	673	1482.25	reflect
444	675	1482.23	expand
445	676	1482.23	reflect
446	677	1482.23	reflect
447	679	1482.2	expand
448	680	1482.2	reflect
449	681	1482.2	reflect
450	682	1482.2	reflect
451	684	1482.18	expand
452	686	1482.16	expand
453	688	1482.16	expand
454	689	1482.16	reflect
455	690	1482.16	reflect
456	691	1482.16	reflect
457	692	1482.16	reflect
458	694	1482.15	reflect
459	696	1482.15	contract inside
460	698	1482.13	reflect
461	699	1482.13	reflect
462	701	1482.13	contract inside
463	702	1482.13	reflect
464	704	1482.12	reflect
465	706	1482.12	reflect
466	708	1482.12	reflect
467	710	1482.12	reflect
468	712	1482.11	reflect
469	714	1482.11	reflect
470	716	1482.08	expand
471	717	1482.08	reflect
472	718	1482.08	reflect
473	719	1482.08	reflect
474	721	1482.07	reflect
475	723	1482.07	reflect
476	724	1482.07	reflect
477	726	1482.05	reflect
478	727	1482.05	reflect
479	729	1482.05	reflect
480	731	1482.03	expand
481	732	1482.03	reflect
482	734	1482.03	reflect
483	736	1482.02	reflect
484	738	1482	expand
485	739	1482	reflect
486	740	1482	reflect
487	742	1481.99	reflect
488	744	1481.95	expand
489	745	1481.95	reflect
490	746	1481.95	reflect
491	747	1481.95	reflect
492	748	1481.95	reflect
493	750	1481.9	expand

494	751	1481.9	reflect
495	752	1481.9	reflect
496	754	1481.84	expand
497	755	1481.84	reflect
498	756	1481.84	reflect
499	757	1481.84	reflect
500	758	1481.84	reflect
501	760	1481.83	reflect
502	762	1481.8	expand
503	764	1481.8	contract inside
504	765	1481.8	reflect
505	767	1481.66	expand
506	768	1481.66	reflect
507	769	1481.66	reflect
508	770	1481.66	reflect
509	771	1481.66	reflect
510	773	1481.62	expand
511	775	1481.55	expand
512	777	1481.5	expand
513	779	1481.31	expand
514	781	1481.13	expand
515	782	1481.13	reflect
516	783	1481.13	reflect
517	784	1481.13	reflect
518	785	1481.13	reflect
519	787	1480.74	expand
520	789	1480.47	expand
521	790	1480.47	reflect
522	791	1480.47	reflect
523	792	1480.47	reflect
524	794	1480.02	expand
525	795	1480.02	reflect
526	797	1479.71	expand
527	799	1478.74	expand
528	800	1478.74	reflect
529	801	1478.74	reflect
530	803	1478.58	expand
531	805	1478.48	reflect
532	807	1477.27	expand
533	809	1475.89	expand
534	810	1475.89	reflect
535	812	1474.39	expand
536	813	1474.39	reflect
537	814	1474.39	reflect
538	816	1472.61	expand
539	817	1472.61	reflect
540	819	1471.2	expand
541	821	1466.23	expand
542	822	1466.23	reflect
543	823	1466.23	reflect
544	824	1466.23	reflect
545	826	1463.19	expand
546	828	1460.66	expand
547	830	1455.95	expand

548	831	1455.95	reflect
549	833	1448.09	expand
550	835	1439.19	expand
551	836	1439.19	reflect
552	837	1439.19	reflect
553	838	1439.19	reflect
554	839	1439.19	reflect
555	840	1439.19	reflect
556	842	1430.54	expand
557	843	1430.54	reflect
558	844	1430.54	reflect
559	845	1430.54	reflect
560	846	1430.54	reflect
561	847	1430.54	reflect
562	849	1430.13	contract outside
563	851	1429.07	contract inside
564	853	1428.76	contract inside
565	855	1428.57	reflect
566	857	1428.24	contract inside
567	859	1428.24	contract inside
568	860	1428.24	reflect
569	862	1428.24	contract inside
570	864	1428.24	contract inside
571	866	1427.83	contract inside
572	868	1427.63	reflect
573	870	1427.63	contract inside
574	871	1427.63	reflect
575	873	1427.63	contract inside
576	874	1427.63	reflect
577	876	1427.53	reflect
578	878	1427.51	contract inside
579	880	1427.51	contract inside
580	881	1427.51	reflect
581	883	1427.48	contract inside
582	884	1427.48	reflect
583	886	1427.44	contract inside
584	888	1427.41	reflect
585	890	1427.4	contract outside
586	892	1427.38	contract inside
587	894	1427.38	contract inside
588	896	1427.32	reflect
589	898	1427.27	reflect
590	899	1427.27	reflect
591	901	1427.27	contract inside
592	903	1427.27	contract inside
593	905	1427.27	reflect
594	906	1427.27	reflect
595	908	1427.25	reflect
596	910	1427.25	contract inside
597	912	1427.23	reflect
598	914	1427.21	reflect
599	915	1427.21	reflect
600	917	1427.19	reflect
601	918	1427.19	reflect

602	919	1427.19	reflect
603	920	1427.19	reflect
604	921	1427.19	reflect
605	923	1427.19	contract outside
606	925	1427.16	expand
607	927	1427.16	contract inside
608	928	1427.16	reflect
609	929	1427.16	reflect
610	931	1427.16	contract inside
611	933	1427.11	expand
612	934	1427.11	reflect
613	935	1427.11	reflect
614	936	1427.11	reflect
615	937	1427.11	reflect
616	938	1427.11	reflect
617	939	1427.11	reflect
618	940	1427.11	reflect
619	942	1427.1	reflect
620	944	1427.09	reflect
621	946	1427.08	reflect
622	948	1427.07	reflect
623	949	1427.07	reflect
624	951	1427.07	contract inside
625	952	1427.07	reflect
626	954	1427.06	reflect
627	955	1427.06	reflect
628	956	1427.06	reflect
629	957	1427.06	reflect
630	959	1427.06	contract inside
631	961	1427.05	reflect
632	962	1427.05	reflect
633	964	1427.04	reflect
634	965	1427.04	reflect
635	967	1427.04	contract inside
636	968	1427.04	reflect
637	970	1427.04	reflect
638	971	1427.04	reflect
639	972	1427.04	reflect
640	974	1427.04	contract inside
641	976	1427.04	contract inside
642	978	1427.04	contract inside
643	980	1427.04	reflect
644	982	1427.04	contract outside
645	983	1427.04	reflect
646	985	1427.04	contract inside
647	987	1427.04	contract inside
648	988	1427.04	reflect
649	989	1427.04	reflect
650	990	1427.04	reflect
651	992	1427.04	contract inside
652	994	1427.04	contract inside
653	995	1427.04	reflect
654	996	1427.04	reflect
655	997	1427.04	reflect

```
656          998        1427.04        reflect
657          1000       1427.04        contract inside
658          1002       1427.04        contract inside
659          1004       1427.04        contract outside
660          1006       1427.04        contract inside
661          1008       1427.04        contract inside
662          1010       1427.04        contract inside
663          1012       1427.04        contract outside
664          1014       1427.04        contract inside
665          1016       1427.04        contract outside
666          1018       1427.04        contract inside
667          1020       1427.04        contract inside
668          1022       1427.04        contract inside
669          1024       1427.04        contract inside
670          1026       1427.04        reflect
671          1027       1427.04        reflect
672          1029       1427.04        contract inside
673          1030       1427.04        reflect
674          1031       1427.04        reflect
675          1033       1427.04        reflect
676          1034       1427.04        reflect
677          1035       1427.04        reflect
678          1037       1427.04        contract inside
679          1039       1427.04        contract inside
680          1041       1427.04        contract inside
681          1043       1427.04        contract inside
682          1044       1427.04        reflect
683          1046       1427.04        contract inside
684          1048       1427.04        contract inside
685          1050       1427.04        contract inside
686          1052       1427.04        reflect
687          1053       1427.04        reflect
688          1054       1427.04        reflect
689          1056       1427.04        contract inside
690          1058       1427.04        contract inside
691          1059       1427.04        reflect
692          1060       1427.04        reflect
693          1061       1427.04        reflect
694          1063       1427.04        reflect
695          1065       1427.04        contract inside
696          1066       1427.04        reflect
697          1068       1427.04        contract inside
698          1070       1427.04        contract inside
699          1072       1427.04        contract inside
700          1073       1427.04        reflect
701          1075       1427.04        contract outside
702          1077       1427.04        contract inside
703          1079       1427.04        contract inside
704          1081       1427.04        contract inside
705          1083       1427.04        contract inside
706          1085       1427.04        contract inside
707          1087       1427.04        contract inside

     Optimization terminated:
```

the current x satisfies the termination criteria using OPTIONS.TolX
of 1.000000e-04
and F(X) satisfies the convergence criteria using OPTIONS.TolFun of
1.000000e-04

Iteration	Func-count	f(x)	Step-size	First-order optimality
0	7	357225		1.68e+07
1	14	29982.8	5.94995e-08	3.02e+04
2	49	2480.91	455.5	2.37e+04
3	98	1781.57	0.015625	5.99e+03
4	105	1780.48	1	4.87e+03
5	112	1766.87	1	1.19e+03
6	119	1766.57	1	1.02e+03
7	126	1766.3	1	1.02e+03
8	133	1764.24	1	1.55e+03
9	140	1760.32	1	2.87e+03
10	147	1749.51	1	5.09e+03
11	154	1727.7	1	7.47e+03
12	161	1690.16	1	8.38e+03
13	168	1648.82	1	5.4e+03
14	175	1632.13	1	1.34e+03
15	182	1630.75	1	647
16	189	1630.68	1	581
17	196	1630.57	1	518
18	203	1630.24	1	872
19	210	1629.45	1	1.46e+03
Iteration	Func-count	f(x)	Step-size	First-order optimality
20	217	1627.36	1	2.4e+03
21	224	1622.19	1	3.77e+03
22	231	1609.92	1	5.57e+03
23	238	1584.14	1	7.23e+03
24	245	1545.27	1	6.92e+03
25	252	1523.05	1	3.46e+03
26	259	1515.55	1	1.49e+03
27	266	1512.87	1	205
28	273	1512.79	1	222
29	280	1512.78	1	219
30	287	1512.77	1	216
31	294	1512.76	1	211
32	301	1512.72	1	203
33	308	1512.63	1	317
34	315	1512.38	1	520
35	322	1511.77	1	825
36	329	1510.34	1	1.23e+03
37	336	1507.51	1	1.6e+03
38	343	1503.53	1	1.52e+03
39	350	1500.54	1	799
Iteration	Func-count	f(x)	Step-size	First-order optimality
40	357	1499.78	1	156
41	364	1499.73	1	58.2
42	371	1499.73	1	58.4

Iteration	Func-count	f(x)	Step-size	First-order optimality
43	378	1499.73	1	58.4
44	385	1499.73	1	58.3
45	392	1499.73	1	58.1
46	399	1499.72	1	57.7
47	406	1499.7	1	57.2
48	413	1499.66	1	93.5
49	420	1499.54	1	158
50	427	1499.25	1	262
51	434	1498.5	1	423
52	441	1496.67	1	653
53	448	1492.81	1	903
54	455	1486.73	1	975
55	462	1481.58	1	621
56	469	1479.97	1	137
57	476	1479.82	1	126
58	483	1479.81	1	125
59	490	1479.81	1	124
Iteration	Func-count	f(x)	Step-size	First-order optimality
60	497	1479.8	1	121
61	504	1479.78	1	117
62	511	1479.72	1	110
63	518	1479.55	1	161
64	525	1479.13	1	275
65	532	1478.03	1	456
66	539	1475.29	1	730
67	546	1468.9	1	1.09e+03
68	553	1456.44	1	1.42e+03
69	560	1439.97	1	1.32e+03
70	567	1429.45	1	625
71	574	1427.18	1	44.8
72	581	1427.04	1	32.7
73	588	1427.04	1	9.26

Local minimum found.

Optimization completed because the size of the gradient is less than the value of the optimality tolerance.

Iteration	Func-count	f(x)	Norm of step	First-order optimality
0	7	9.56466e+08		5.11e+10
1	14	1.29348e+08	0.98501	6.91e+09
2	21	1.74742e+07	0.959427	9.36e+08
3	28	2.3572e+06	0.890975	1.27e+08
4	35	319976	0.712686	1.72e+07
5	42	47401.9	0.280683	2.34e+06
6	49	11552.8	0.601971	3.19e+05
7	56	6794.56	1.82922	4.19e+04
8	63	5683.38	2.75085	8.69e+03
9	70	5541.93	1.08169	2.5e+03
10	77	5537.98	0.0258845	32.5
11	84	5537.85	0.00654548	17

```
   12            91          5537.84        0.003398              3.99
   13            98          5537.84      0.000550991              1.68


Local minimum possible.

lsqnonlin stopped because the final change in the sum of squares
 relative to
its initial value is less than the value of the function tolerance.


   Iteration    Func-count        min f(x)          Procedure
       0             1          9.56466e+08
       1             7          9.56466e+08       initial simplex
       2             9          3.82373e+08       expand
       3            10          3.82373e+08       reflect
       4            11          3.82373e+08       reflect
       5            12          3.82373e+08       reflect
       6            13          3.82373e+08       reflect
       7            15          1.86274e+08       expand
       8            16          1.86274e+08       reflect
       9            17          1.86274e+08       reflect
      10            19          6.59893e+07       expand
      11            20          6.59893e+07       reflect
      12            22          2.26825e+07       expand
      13            23          2.26825e+07       reflect
      14            24          2.26825e+07       reflect
      15            26          3.71547e+06       expand
      16            27          3.71547e+06       reflect
      17            29            664247          expand
      18            30            664247          reflect
      19            31            664247          reflect
      20            33           32047.7          expand
      21            34           32047.7          reflect
      22            35           32047.7          reflect
      23            37           6829.66          expand
      24            38           6829.66          reflect
      25            40           6818.88          reflect
      26            41           6818.88          reflect
      27            42           6818.88          reflect
      28            43           6818.88          reflect
      29            45           6818.88          contract outside
      30            47           6818.88          contract outside
      31            49           6816.48          reflect
      32            50           6816.48          reflect
      33            52           6816.48          contract inside
      34            54           6816.48          contract inside
      35            56           6816.48          contract inside
      36            58           6816.48          contract inside
      37            60           6813.19          contract inside
      38            61           6813.19          reflect
      39            63           6813.19          contract inside
      40            65           6813.19          contract inside
      41            67           6813.19          contract inside
      42            69           6813.19          contract outside
```

43	71	6813.19	contract inside
44	73	6792.74	expand
45	75	6792.74	contract inside
46	76	6792.74	reflect
47	77	6792.74	reflect
48	79	6775.88	expand
49	80	6775.88	reflect
50	82	6761.05	expand
51	84	6742.64	expand
52	85	6742.64	reflect
53	86	6742.64	reflect
54	88	6690.06	expand
55	89	6690.06	reflect
56	91	6670.21	expand
57	93	6607.09	expand
58	94	6607.09	reflect
59	95	6607.09	reflect
60	97	6573.8	reflect
61	99	6498.62	expand
62	100	6498.62	reflect
63	101	6498.62	reflect
64	103	6477.82	expand
65	104	6477.82	reflect
66	105	6477.82	reflect
67	107	6463.44	reflect
68	109	6452.06	reflect
69	111	6452.06	contract inside
70	113	6387.83	expand
71	115	6387.83	contract inside
72	116	6387.83	reflect
73	117	6387.83	reflect
74	118	6387.83	reflect
75	120	6387.83	contract inside
76	121	6387.83	reflect
77	123	6387.83	contract outside
78	124	6387.83	reflect
79	126	6387.83	contract inside
80	128	6387.83	contract inside
81	130	6387.83	contract inside
82	131	6387.83	reflect
83	133	6387.83	contract inside
84	135	6387.83	contract inside
85	137	6387.83	contract outside
86	138	6387.83	reflect
87	139	6387.83	reflect
88	141	6387.83	contract inside
89	142	6387.83	reflect
90	143	6387.83	reflect
91	145	6384.43	expand
92	147	6380.26	expand
93	148	6380.26	reflect
94	149	6380.26	reflect
95	151	6380.26	contract inside
96	152	6380.26	reflect

97	154	6372.82	expand
98	155	6372.82	reflect
99	156	6372.82	reflect
100	158	6369.2	expand
101	159	6369.2	reflect
102	161	6362	expand
103	163	6350.65	expand
104	164	6350.65	reflect
105	165	6350.65	reflect
106	167	6345.11	expand
107	168	6345.11	reflect
108	170	6335.36	expand
109	171	6335.36	reflect
110	173	6332.29	expand
111	175	6331.7	reflect
112	177	6331.7	contract inside
113	178	6331.7	reflect
114	179	6331.7	reflect
115	181	6331.7	contract inside
116	182	6331.7	reflect
117	184	6330.76	reflect
118	185	6330.76	reflect
119	187	6328.73	reflect
120	189	6328.73	contract inside
121	191	6328.73	contract inside
122	193	6328.23	contract inside
123	195	6328.23	contract inside
124	197	6327.95	reflect
125	199	6327.66	contract outside
126	200	6327.66	reflect
127	202	6327.17	contract inside
128	204	6327.05	contract inside
129	206	6326.31	reflect
130	207	6326.31	reflect
131	209	6325.95	reflect
132	211	6325.95	contract inside
133	212	6325.95	reflect
134	213	6325.95	reflect
135	215	6325.95	contract inside
136	217	6325.5	reflect
137	219	6325.29	reflect
138	220	6325.29	reflect
139	222	6325	reflect
140	224	6324.59	reflect
141	226	6324.35	reflect
142	227	6324.35	reflect
143	228	6324.35	reflect
144	230	6324.35	contract inside
145	232	6324.29	reflect
146	234	6323.23	expand
147	235	6323.23	reflect
148	237	6323.23	contract inside
149	239	6322.92	expand
150	241	6322.27	expand

151	243	6320.76	expand
152	244	6320.76	reflect
153	246	6319.51	expand
154	248	6318.86	expand
155	250	6317.61	expand
156	252	6314.21	expand
157	253	6314.21	reflect
158	254	6314.21	reflect
159	256	6313.77	reflect
160	258	6312.45	reflect
161	259	6312.45	reflect
162	260	6312.45	reflect
163	261	6312.45	reflect
164	263	6311.05	reflect
165	265	6311.05	contract inside
166	267	6311.05	contract inside
167	268	6311.05	reflect
168	270	6311.05	contract inside
169	272	6311.05	contract inside
170	273	6311.05	reflect
171	274	6311.05	reflect
172	275	6311.05	reflect
173	276	6311.05	reflect
174	278	6310.45	expand
175	280	6309.4	expand
176	281	6309.4	reflect
177	282	6309.4	reflect
178	283	6309.4	reflect
179	285	6309.2	reflect
180	287	6307.33	expand
181	288	6307.33	reflect
182	289	6307.33	reflect
183	290	6307.33	reflect
184	292	6306.86	reflect
185	293	6306.86	reflect
186	295	6306.24	reflect
187	297	6302.06	expand
188	298	6302.06	reflect
189	299	6302.06	reflect
190	300	6302.06	reflect
191	301	6302.06	reflect
192	303	6300.01	expand
193	305	6298.03	expand
194	306	6298.03	reflect
195	308	6297.9	reflect
196	310	6286.29	expand
197	311	6286.29	reflect
198	312	6286.29	reflect
199	313	6286.29	reflect
200	315	6278.21	expand
201	316	6278.21	reflect
202	318	6262.67	expand
203	319	6262.67	reflect
204	320	6262.67	reflect

205	322	6250.3	expand
206	324	6228.46	expand
207	325	6228.46	reflect
208	327	6212.15	expand
209	329	6181.72	expand
210	330	6181.72	reflect
211	332	6150.46	expand
212	333	6150.46	reflect
213	335	6119.06	expand
214	336	6119.06	reflect
215	338	6105.82	expand
216	339	6105.82	reflect
217	341	6007.34	expand
218	342	6007.34	reflect
219	344	6007.34	contract inside
220	345	6007.34	reflect
221	346	6007.34	reflect
222	347	6007.34	reflect
223	349	6007.34	contract inside
224	351	5919.05	expand
225	352	5919.05	reflect
226	353	5919.05	reflect
227	354	5919.05	reflect
228	356	5889.58	expand
229	358	5830.47	expand
230	360	5802.54	expand
231	362	5729.53	expand
232	363	5729.53	reflect
233	364	5729.53	reflect
234	365	5729.53	reflect
235	367	5729.53	contract inside
236	368	5729.53	reflect
237	369	5729.53	reflect
238	370	5729.53	reflect
239	372	5729.53	contract inside
240	374	5724.35	reflect
241	375	5724.35	reflect
242	377	5703.95	reflect
243	379	5678.83	expand
244	381	5678.83	contract inside
245	382	5678.83	reflect
246	383	5678.83	reflect
247	385	5669.54	reflect
248	386	5669.54	reflect
249	388	5667.67	reflect
250	390	5643.49	reflect
251	392	5643.49	contract inside
252	393	5643.49	reflect
253	395	5643.49	contract inside
254	396	5643.49	reflect
255	398	5643.49	contract inside
256	400	5643.49	contract inside
257	402	5643.49	contract inside
258	403	5643.49	reflect

259	405	5640.94	reflect
260	407	5640.94	contract inside
261	408	5640.94	reflect
262	410	5640.46	contract outside
263	412	5639.58	contract inside
264	413	5639.58	reflect
265	415	5639.31	contract inside
266	417	5638.84	contract inside
267	419	5638.03	reflect
268	421	5638.03	contract outside
269	423	5637.41	contract inside
270	425	5637.41	contract inside
271	426	5637.41	reflect
272	428	5637.06	reflect
273	429	5637.06	reflect
274	431	5636.92	contract inside
275	433	5636.81	contract inside
276	435	5636.65	contract inside
277	437	5636.65	contract outside
278	439	5636.65	contract inside
279	440	5636.65	reflect
280	442	5636.43	contract inside
281	444	5636.43	contract inside
282	446	5636.43	contract inside
283	448	5636.42	contract inside
284	449	5636.42	reflect
285	451	5636.41	contract inside
286	453	5636.4	contract outside
287	455	5636.37	contract outside
288	457	5636.32	reflect
289	459	5636.32	contract inside
290	461	5636.32	contract inside
291	463	5636.32	contract inside
292	464	5636.32	reflect
293	466	5636.32	contract inside
294	468	5636.32	contract inside
295	470	5636.32	contract inside
296	472	5636.3	reflect
297	474	5636.3	contract inside
298	475	5636.3	reflect
299	477	5636.3	contract inside
300	478	5636.3	reflect
301	479	5636.3	reflect
302	480	5636.3	reflect
303	481	5636.3	reflect
304	483	5636.29	contract inside
305	485	5636.29	reflect
306	487	5636.29	contract inside
307	489	5636.29	contract outside
308	491	5636.29	contract outside
309	493	5636.29	contract inside
310	495	5636.29	contract inside
311	497	5636.29	reflect
312	499	5636.29	contract inside

313	501	5636.28	contract inside
314	503	5636.28	contract inside
315	504	5636.28	reflect
316	505	5636.28	reflect
317	507	5636.28	contract inside
318	509	5636.28	contract inside
319	511	5636.28	contract inside
320	512	5636.28	reflect
321	514	5636.28	reflect
322	516	5636.28	contract inside
323	518	5636.28	contract outside
324	520	5636.28	reflect
325	522	5636.28	contract inside
326	523	5636.28	reflect
327	524	5636.28	reflect
328	525	5636.28	reflect
329	527	5636.28	contract inside
330	529	5636.28	contract inside
331	531	5636.28	contract inside
332	532	5636.28	reflect
333	534	5636.28	contract inside
334	536	5636.28	contract inside
335	538	5636.28	contract inside
336	540	5636.28	reflect
337	541	5636.28	reflect
338	543	5636.28	contract inside
339	545	5636.28	reflect
340	547	5636.28	reflect
341	549	5636.28	contract inside
342	551	5636.28	contract inside
343	552	5636.28	reflect
344	554	5636.28	expand
345	555	5636.28	reflect
346	556	5636.28	reflect
347	558	5636.28	contract inside
348	559	5636.28	reflect
349	560	5636.28	reflect
350	561	5636.28	reflect
351	562	5636.28	reflect
352	563	5636.28	reflect
353	565	5636.28	contract outside
354	566	5636.28	reflect
355	567	5636.28	reflect
356	569	5636.28	reflect
357	570	5636.28	reflect
358	572	5636.28	contract inside
359	574	5636.28	contract inside
360	576	5636.28	contract inside
361	577	5636.28	reflect
362	579	5636.28	contract outside
363	581	5636.28	contract inside
364	583	5636.28	expand
365	584	5636.28	reflect
366	585	5636.28	reflect

367	586	5636.28	reflect
368	587	5636.28	reflect
369	589	5636.28	expand
370	590	5636.28	reflect
371	592	5636.28	expand
372	593	5636.28	reflect
373	594	5636.28	reflect
374	596	5636.28	expand
375	598	5636.28	expand
376	599	5636.28	reflect
377	600	5636.28	reflect
378	602	5636.28	expand
379	603	5636.28	reflect
380	604	5636.28	reflect
381	606	5636.28	expand
382	607	5636.28	reflect
383	608	5636.28	reflect
384	610	5636.28	expand
385	611	5636.28	reflect
386	612	5636.28	reflect
387	614	5636.28	expand
388	615	5636.28	reflect
389	617	5636.28	expand
390	619	5636.28	expand
391	620	5636.28	reflect
392	622	5636.28	expand
393	624	5636.28	expand
394	625	5636.28	reflect
395	627	5636.28	expand
396	629	5636.28	expand
397	630	5636.28	reflect
398	632	5636.27	expand
399	634	5636.27	expand
400	635	5636.27	reflect
401	636	5636.27	reflect
402	638	5636.27	expand
403	639	5636.27	reflect
404	640	5636.27	reflect
405	642	5636.27	reflect
406	643	5636.27	reflect
407	644	5636.27	reflect
408	646	5636.27	contract outside
409	648	5636.27	reflect
410	649	5636.27	reflect
411	651	5636.27	contract inside
412	652	5636.27	reflect
413	654	5636.27	expand
414	655	5636.27	reflect
415	657	5636.27	contract inside
416	658	5636.27	reflect
417	660	5636.27	expand
418	662	5636.27	expand
419	664	5636.27	expand
420	666	5636.26	expand

421	667	5636.26	reflect
422	669	5636.26	reflect
423	670	5636.26	reflect
424	672	5636.26	expand
425	673	5636.26	reflect
426	675	5636.26	contract inside
427	677	5636.26	contract inside
428	678	5636.26	reflect
429	679	5636.26	reflect
430	680	5636.26	reflect
431	681	5636.26	reflect
432	682	5636.26	reflect
433	683	5636.26	reflect
434	685	5636.26	reflect
435	687	5636.26	contract inside
436	689	5636.26	reflect
437	690	5636.26	reflect
438	691	5636.26	reflect
439	693	5636.26	reflect
440	695	5636.26	expand
441	696	5636.26	reflect
442	698	5636.26	expand
443	700	5636.26	expand
444	702	5636.26	expand
445	703	5636.26	reflect
446	704	5636.26	reflect
447	706	5636.25	expand
448	707	5636.25	reflect
449	708	5636.25	reflect
450	709	5636.25	reflect
451	711	5636.25	expand
452	713	5636.24	expand
453	715	5636.24	expand
454	716	5636.24	reflect
455	718	5636.22	expand
456	719	5636.22	reflect
457	721	5636.22	expand
458	722	5636.22	reflect
459	724	5636.2	expand
460	726	5636.18	expand
461	728	5636.16	expand
462	729	5636.16	reflect
463	730	5636.16	reflect
464	731	5636.16	reflect
465	733	5636.1	expand
466	734	5636.1	reflect
467	735	5636.1	reflect
468	737	5636.08	expand
469	739	5636.05	expand
470	741	5635.95	expand
471	742	5635.95	reflect
472	743	5635.95	reflect
473	744	5635.95	reflect
474	745	5635.95	reflect

475	747	5635.86	expand
476	748	5635.86	reflect
477	750	5635.8	expand
478	752	5635.67	expand
479	753	5635.67	reflect
480	755	5635.54	expand
481	756	5635.54	reflect
482	757	5635.54	reflect
483	759	5635.36	expand
484	760	5635.36	reflect
485	762	5635.28	expand
486	763	5635.28	reflect
487	764	5635.28	reflect
488	766	5635.21	reflect
489	768	5635.19	reflect
490	769	5635.19	reflect
491	771	5635.19	contract inside
492	772	5635.19	reflect
493	773	5635.19	reflect
494	775	5635.19	contract inside
495	777	5635.08	expand
496	779	5635.08	contract outside
497	780	5635.08	reflect
498	781	5635.08	reflect
499	782	5635.08	reflect
500	784	5635.03	expand
501	785	5635.03	reflect
502	786	5635.03	reflect
503	788	5634.93	expand
504	790	5634.89	expand
505	792	5634.81	expand
506	793	5634.81	reflect
507	795	5634.72	expand
508	797	5634.67	expand
509	799	5634.62	reflect
510	801	5634.59	reflect
511	802	5634.59	reflect
512	804	5634.48	reflect
513	805	5634.48	reflect
514	806	5634.48	reflect
515	807	5634.48	reflect
516	808	5634.48	reflect
517	810	5634.25	expand
518	812	5634.25	contract outside
519	813	5634.25	reflect
520	815	5634.24	reflect
521	816	5634.24	reflect
522	818	5634.13	expand
523	819	5634.13	reflect
524	821	5634.08	reflect
525	823	5634.04	reflect
526	825	5633.69	expand
527	826	5633.69	reflect
528	827	5633.69	reflect

529	828	5633.69	reflect
530	830	5633.59	reflect
531	831	5633.59	reflect
532	833	5633.4	expand
533	834	5633.4	reflect
534	836	5633.31	reflect
535	837	5633.31	reflect
536	839	5633.14	expand
537	840	5633.14	reflect
538	842	5632.29	expand
539	843	5632.29	reflect
540	844	5632.29	reflect
541	845	5632.29	reflect
542	846	5632.29	reflect
543	847	5632.29	reflect
544	849	5631.34	expand
545	850	5631.34	reflect
546	852	5630.48	expand
547	853	5630.48	reflect
548	854	5630.48	reflect
549	855	5630.48	reflect
550	857	5628.58	expand
551	858	5628.58	reflect
552	860	5627.26	expand
553	861	5627.26	reflect
554	863	5626.41	expand
555	865	5623.92	expand
556	867	5621.95	expand
557	868	5621.95	reflect
558	870	5618.56	expand
559	871	5618.56	reflect
560	873	5615.94	expand
561	875	5612.61	expand
562	877	5611.66	expand
563	879	5608.75	expand
564	880	5608.75	reflect
565	881	5608.75	reflect
566	883	5608.75	contract inside
567	884	5608.75	reflect
568	885	5608.75	reflect
569	886	5608.75	reflect
570	887	5608.75	reflect
571	889	5608.66	reflect
572	891	5600.56	expand
573	893	5600.56	contract inside
574	895	5600.56	contract inside
575	896	5600.56	reflect
576	897	5600.56	reflect
577	898	5600.56	reflect
578	899	5600.56	reflect
579	901	5600.56	contract outside
580	902	5600.56	reflect
581	904	5598.35	expand
582	905	5598.35	reflect

583	907	5596.79	reflect
584	909	5589.11	expand
585	910	5589.11	reflect
586	911	5589.11	reflect
587	913	5585.97	expand
588	915	5581.25	expand
589	917	5576.98	expand
590	919	5572.62	expand
591	921	5567.89	expand
592	923	5557.49	expand
593	925	5557.25	reflect
594	927	5555.68	reflect
595	929	5544.55	reflect
596	931	5544.55	contract inside
597	932	5544.55	reflect
598	933	5544.55	reflect
599	934	5544.55	reflect
600	936	5540.22	reflect
601	938	5540.22	contract inside
602	939	5540.22	reflect
603	941	5540.22	contract inside
604	943	5540.22	contract inside
605	944	5540.22	reflect
606	945	5540.22	reflect
607	947	5539.91	contract outside
608	948	5539.91	reflect
609	950	5539.39	contract inside
610	952	5539.39	contract inside
611	954	5539.39	contract outside
612	956	5538.76	reflect
613	957	5538.76	reflect
614	959	5538.12	contract inside
615	961	5538.12	contract inside
616	962	5538.12	reflect
617	963	5538.12	reflect
618	964	5538.12	reflect
619	966	5538.12	contract inside
620	968	5538.12	contract outside
621	970	5538	contract inside
622	972	5538	contract inside
623	974	5538	contract inside
624	976	5538	contract inside
625	977	5538	reflect
626	979	5537.94	contract inside
627	980	5537.94	reflect
628	982	5537.91	contract inside
629	984	5537.91	contract outside
630	986	5537.91	contract inside
631	988	5537.9	contract inside
632	990	5537.9	contract inside
633	992	5537.88	contract inside
634	993	5537.88	reflect
635	994	5537.88	reflect
636	996	5537.88	contract inside

637	998	5537.87	reflect
638	1000	5537.87	contract inside
639	1001	5537.87	reflect
640	1003	5537.86	reflect
641	1005	5537.86	contract inside
642	1007	5537.86	contract inside
643	1009	5537.86	contract inside
644	1010	5537.86	reflect
645	1012	5537.85	contract inside
646	1014	5537.85	contract inside
647	1015	5537.85	reflect
648	1017	5537.85	reflect
649	1019	5537.85	contract inside
650	1020	5537.85	reflect
651	1022	5537.85	contract inside
652	1024	5537.85	reflect
653	1025	5537.85	reflect
654	1026	5537.85	reflect
655	1027	5537.85	reflect
656	1029	5537.85	contract inside
657	1030	5537.85	reflect
658	1032	5537.85	contract inside
659	1033	5537.85	reflect
660	1034	5537.85	reflect
661	1036	5537.84	reflect
662	1038	5537.84	contract inside
663	1039	5537.84	reflect
664	1041	5537.84	contract inside
665	1042	5537.84	reflect
666	1044	5537.84	reflect
667	1045	5537.84	reflect
668	1047	5537.84	contract inside
669	1048	5537.84	reflect
670	1049	5537.84	reflect
671	1051	5537.84	contract inside
672	1053	5537.84	contract inside
673	1055	5537.84	contract inside
674	1056	5537.84	reflect
675	1058	5537.84	reflect
676	1060	5537.84	contract inside
677	1061	5537.84	reflect
678	1062	5537.84	reflect
679	1063	5537.84	reflect
680	1065	5537.84	reflect
681	1067	5537.84	expand
682	1069	5537.84	reflect
683	1071	5537.84	reflect
684	1072	5537.84	reflect
685	1074	5537.84	reflect
686	1075	5537.84	reflect
687	1077	5537.84	reflect
688	1078	5537.84	reflect
689	1079	5537.84	reflect
690	1080	5537.84	reflect

```
691          1081          5537.84          reflect
692          1083          5537.84          contract inside
693          1085          5537.84          reflect
694          1087          5537.84          contract inside
695          1089          5537.84          contract inside
696          1090          5537.84          reflect
697          1092          5537.84          contract inside
698          1094          5537.84          contract inside
699          1096          5537.84          reflect
700          1097          5537.84          reflect
701          1099          5537.84          contract inside
702          1100          5537.84          reflect
703          1102          5537.84          contract outside
704          1104          5537.84          reflect
705          1106          5537.84          contract inside
706          1107          5537.84          reflect
707          1108          5537.84          reflect
708          1109          5537.84          reflect
709          1111          5537.84          reflect
710          1113          5537.84          contract inside
711          1115          5537.84          contract inside
712          1117          5537.84          contract inside
713          1119          5537.84          contract outside
714          1121          5537.84          contract inside
715          1123          5537.84          contract inside
716          1124          5537.84          reflect
717          1126          5537.84          contract inside
718          1128          5537.84          contract inside
719          1130          5537.84          reflect
720          1131          5537.84          reflect
721          1133          5537.84          contract inside
722          1134          5537.84          reflect
723          1136          5537.84          contract inside
724          1138          5537.84          contract inside
725          1140          5537.84          contract inside
726          1142          5537.84          reflect
727          1144          5537.84          contract inside
728          1146          5537.84          reflect
729          1147          5537.84          reflect
730          1149          5537.84          contract inside
731          1151          5537.84          contract inside
732          1152          5537.84          reflect
733          1153          5537.84          reflect
734          1155          5537.84          contract outside
735          1157          5537.84          contract inside
736          1159          5537.84          contract inside
737          1160          5537.84          reflect
738          1161          5537.84          reflect
739          1163          5537.84          contract inside

Optimization terminated:
 the current x satisfies the termination criteria using OPTIONS.TolX
 of 1.000000e-04
```

and F(X) satisfies the convergence criteria using OPTIONS.TolFun of
1.000000e-04

Iteration	*Func-count*	*min f(x)*	*Procedure*
0	*1*	*2.27191e+16*	
1	*7*	*2.27191e+16*	*initial simplex*
2	*9*	*3.22698e+15*	*expand*
3	*10*	*3.22698e+15*	*reflect*
4	*11*	*3.22698e+15*	*reflect*
5	*12*	*3.22698e+15*	*reflect*
6	*13*	*3.22698e+15*	*reflect*
7	*15*	*7.05896e+14*	*expand*
8	*16*	*7.05896e+14*	*reflect*
9	*17*	*7.05896e+14*	*reflect*
10	*19*	*7.37761e+13*	*expand*
11	*20*	*7.37761e+13*	*reflect*
12	*22*	*7.05726e+12*	*expand*
13	*23*	*7.05726e+12*	*reflect*
14	*24*	*7.05726e+12*	*reflect*
15	*26*	*1.2859e+11*	*expand*
16	*27*	*1.2859e+11*	*reflect*
17	*29*	*2.91568e+09*	*expand*
18	*30*	*2.91568e+09*	*reflect*
19	*31*	*2.91568e+09*	*reflect*
20	*33*	*5.47505e+06*	*expand*
21	*34*	*5.47505e+06*	*reflect*
22	*35*	*5.47505e+06*	*reflect*
23	*37*	*6088.84*	*expand*
24	*38*	*6088.84*	*reflect*
25	*39*	*6088.84*	*reflect*
26	*41*	*4873.13*	*reflect*
27	*43*	*4179.76*	*reflect*
28	*44*	*4179.76*	*reflect*
29	*45*	*4179.76*	*reflect*
30	*47*	*4179.76*	*contract outside*
31	*49*	*4179.76*	*contract inside*
32	*51*	*4179.76*	*contract inside*
33	*53*	*4179.76*	*contract inside*
34	*55*	*4179.76*	*contract inside*
35	*57*	*3904.59*	*contract inside*
36	*59*	*3904.59*	*contract inside*
37	*60*	*3904.59*	*reflect*
38	*61*	*3904.59*	*reflect*
39	*63*	*3904.59*	*contract inside*
40	*65*	*3904.59*	*contract inside*
41	*67*	*3904.59*	*contract inside*
42	*69*	*3904.59*	*contract outside*
43	*71*	*3904.59*	*contract inside*
44	*73*	*3904.59*	*contract inside*
45	*75*	*3904.59*	*contract inside*
46	*77*	*3904.59*	*contract outside*
47	*79*	*3904.59*	*contract inside*
48	*81*	*3904.59*	*contract outside*

49	83	3904.59	contract inside
50	85	3902.47	reflect
51	86	3902.47	reflect
52	88	3902.47	contract inside
53	89	3902.47	reflect
54	90	3902.47	reflect
55	91	3902.47	reflect
56	93	3902.47	contract inside
57	95	3902.47	contract inside
58	97	3899.59	reflect
59	99	3899.59	contract inside
60	100	3899.59	reflect
61	101	3899.59	reflect
62	103	3895.23	expand
63	105	3895.23	contract inside
64	106	3895.23	reflect
65	108	3892.5	expand
66	110	3885.31	expand
67	111	3885.31	reflect
68	112	3885.31	reflect
69	113	3885.31	reflect
70	115	3876.08	expand
71	116	3876.08	reflect
72	118	3866.88	expand
73	119	3866.88	reflect
74	121	3848.6	expand
75	122	3848.6	reflect
76	124	3834.89	expand
77	125	3834.89	reflect
78	127	3811.47	expand
79	128	3811.47	reflect
80	130	3777.24	expand
81	131	3777.24	reflect
82	132	3777.24	reflect
83	134	3744.06	expand
84	136	3711.05	expand
85	137	3711.05	reflect
86	138	3711.05	reflect
87	139	3711.05	reflect
88	140	3711.05	reflect
89	142	3701.36	reflect
90	144	3700	reflect
91	146	3683.47	expand
92	147	3683.47	reflect
93	149	3677.3	reflect
94	150	3677.3	reflect
95	152	3677.3	contract inside
96	154	3658.14	expand
97	155	3658.14	reflect
98	157	3658.14	contract inside
99	159	3658.14	contract outside
100	160	3658.14	reflect
101	161	3658.14	reflect
102	162	3658.14	reflect

103	164	3650.79	expand
104	165	3650.79	reflect
105	167	3650.5	reflect
106	169	3648.06	reflect
107	171	3648.06	contract inside
108	172	3648.06	reflect
109	174	3647.73	reflect
110	176	3641.57	reflect
111	178	3639.3	reflect
112	180	3639.3	contract inside
113	181	3639.3	reflect
114	182	3639.3	reflect
115	183	3639.3	reflect
116	185	3639.3	contract inside
117	187	3636.89	reflect
118	189	3636.89	contract inside
119	190	3636.89	reflect
120	192	3636.6	reflect
121	194	3634.15	expand
122	195	3634.15	reflect
123	197	3627.92	expand
124	198	3627.92	reflect
125	200	3625.06	expand
126	201	3625.06	reflect
127	202	3625.06	reflect
128	204	3612.96	expand
129	205	3612.96	reflect
130	206	3612.96	reflect
131	208	3608.3	expand
132	210	3604.67	expand
133	212	3600.01	reflect
134	214	3579.55	expand
135	215	3579.55	reflect
136	216	3579.55	reflect
137	217	3579.55	reflect
138	219	3578.53	reflect
139	220	3578.53	reflect
140	222	3556.02	expand
141	224	3529.03	expand
142	225	3529.03	reflect
143	226	3529.03	reflect
144	227	3529.03	reflect
145	229	3510.68	expand
146	230	3510.68	reflect
147	232	3488.6	expand
148	233	3488.6	reflect
149	235	3462.1	expand
150	237	3422.04	expand
151	238	3422.04	reflect
152	240	3417.68	reflect
153	241	3417.68	reflect
154	242	3417.68	reflect
155	244	3411.68	reflect
156	246	3363.11	reflect

157	248	3363.11	contract inside
158	249	3363.11	reflect
159	251	3363.11	contract inside
160	253	3351.12	expand
161	255	3341.91	reflect
162	257	3341.91	contract outside
163	258	3341.91	reflect
164	260	3340.08	reflect
165	262	3328.93	reflect
166	263	3328.93	reflect
167	264	3328.93	reflect
168	266	3328.93	contract outside
169	268	3328.93	contract inside
170	269	3328.93	reflect
171	271	3320.67	reflect
172	273	3320.67	contract inside
173	275	3320.67	contract inside
174	276	3320.67	reflect
175	278	3320.67	contract inside
176	280	3320.67	contract inside
177	281	3320.67	reflect
178	283	3320.67	contract inside
179	284	3320.67	reflect
180	286	3320.67	contract inside
181	288	3319.52	reflect
182	290	3319.52	contract inside
183	291	3319.52	reflect
184	293	3319.52	contract inside
185	294	3319.52	reflect
186	296	3316.2	expand
187	297	3316.2	reflect
188	298	3316.2	reflect
189	299	3316.2	reflect
190	301	3313.33	expand
191	302	3313.33	reflect
192	304	3313.33	contract inside
193	306	3308.02	expand
194	307	3308.02	reflect
195	308	3308.02	reflect
196	309	3308.02	reflect
197	311	3307.92	reflect
198	313	3297.79	expand
199	314	3297.79	reflect
200	315	3297.79	reflect
201	316	3297.79	reflect
202	318	3289.02	expand
203	319	3289.02	reflect
204	321	3270.57	expand
205	322	3270.57	reflect
206	323	3270.57	reflect
207	325	3257.86	expand
208	326	3257.86	reflect
209	327	3257.86	reflect
210	329	3247.76	expand

```
211        331        3221.44        expand
212        332        3221.44        reflect
213        334        3209.53        expand
214        336        3189.37        expand
215        338        3176.26        expand
216        340        3122.06        expand
217        342        3073.93        expand
218        343        3073.93        reflect
219        344        3073.93        reflect
220        345        3073.93        reflect
221        346        3073.93        reflect
222        348        3007.71        expand
223        349        3007.71        reflect
224        350        3007.71        reflect
225        352        2988.27        expand
226        354        2943.12        expand
227        355        2943.12        reflect
228        357        2863.25        expand
229        358        2863.25        reflect
230        359        2863.25        reflect
231        361        2818.07        reflect
232        363        2751.92        expand
233        364        2751.92        reflect
234        366        2620.01        expand
235        367        2620.01        reflect
236        368        2620.01        reflect
237        370         2444.9        expand
238        371         2444.9        reflect
239        372         2444.9        reflect
240        374        2266.16        expand
241        375        2266.16        reflect
242        376        2266.16        reflect
243        377        2266.16        reflect
244        379        2226.76        reflect
245        381        1859.12        expand
246        383        1857.64        reflect
247        384        1857.64        reflect
248        385        1857.64        reflect
249        387        1857.64        contract inside
250        389        1855.25        reflect
251        391        1844.57        reflect
252        392        1844.57        reflect
253        394        1697.47        reflect
254        396        1697.47        contract outside
255        398        1697.47        contract inside
256        399        1697.47        reflect
257        401        1673.33        reflect
258        402        1673.33        reflect
259        404        1673.33        contract inside
260        406        1673.33        contract inside
261        408        1659.47        contract outside
262        410         1652.7        contract inside
263        412         1652.7        contract inside
264        413         1652.7        reflect
```

265	415	1649.44	contract inside
266	417	1642.74	contract inside
267	419	1637.25	contract inside
268	421	1637.25	contract inside
269	422	1637.25	reflect
270	424	1634.01	reflect
271	426	1631.33	reflect
272	428	1631.33	contract inside
273	430	1623.42	reflect
274	431	1623.42	reflect
275	433	1615.95	reflect
276	434	1615.95	reflect
277	436	1615.95	contract inside
278	438	1615.95	contract inside
279	439	1615.95	reflect
280	440	1615.95	reflect
281	441	1615.95	reflect
282	443	1615.95	contract inside
283	445	1615.95	contract inside
284	446	1615.95	reflect
285	448	1612.29	reflect
286	450	1612.29	contract inside
287	451	1612.29	reflect
288	452	1612.29	reflect
289	453	1612.29	reflect
290	454	1612.29	reflect
291	456	1609	reflect
292	457	1609	reflect
293	459	1609	contract inside
294	460	1609	reflect
295	462	1609	contract inside
296	463	1609	reflect
297	465	1608.4	reflect
298	466	1608.4	reflect
299	468	1608.4	contract inside
300	470	1607.99	reflect
301	472	1607.99	contract outside
302	474	1607.48	reflect
303	476	1607.48	contract inside
304	477	1607.48	reflect
305	478	1607.48	reflect
306	479	1607.48	reflect
307	481	1607.06	reflect
308	482	1607.06	reflect
309	484	1607.06	contract inside
310	486	1606.74	reflect
311	488	1606.74	contract inside
312	490	1606.74	contract inside
313	491	1606.74	reflect
314	493	1606.74	contract inside
315	494	1606.74	reflect
316	496	1606.74	contract inside
317	498	1606.74	contract inside
318	499	1606.74	reflect

319	501	1606.68	contract inside
320	503	1606.68	contract inside
321	505	1606.67	contract inside
322	507	1606.67	contract inside
323	509	1606.63	contract inside
324	511	1606.63	contract inside
325	512	1606.63	reflect
326	514	1606.63	contract inside
327	515	1606.63	reflect
328	516	1606.63	reflect
329	517	1606.63	reflect
330	519	1606.62	contract inside
331	521	1606.62	contract inside
332	523	1606.62	contract inside
333	525	1606.62	contract inside
334	527	1606.62	contract inside
335	529	1606.61	contract inside
336	531	1606.61	contract inside
337	532	1606.61	reflect
338	534	1606.61	contract inside
339	536	1606.61	contract inside
340	538	1606.61	contract inside
341	540	1606.61	contract outside
342	542	1606.61	contract inside
343	544	1606.61	contract inside
344	546	1606.61	reflect
345	547	1606.61	reflect
346	549	1606.61	contract inside
347	551	1606.61	contract inside
348	553	1606.61	contract inside
349	555	1606.61	contract outside
350	557	1606.61	contract inside
351	559	1606.61	reflect
352	561	1606.61	contract inside
353	562	1606.61	reflect
354	563	1606.61	reflect
355	564	1606.61	reflect
356	566	1606.61	reflect
357	567	1606.61	reflect
358	569	1606.61	contract inside
359	570	1606.61	reflect
360	571	1606.61	reflect
361	573	1606.61	reflect
362	575	1606.61	contract inside
363	577	1606.61	expand
364	579	1606.61	contract outside
365	581	1606.61	expand
366	582	1606.61	reflect
367	583	1606.61	reflect
368	585	1606.61	reflect
369	587	1606.61	expand
370	588	1606.61	reflect
371	590	1606.61	expand
372	591	1606.61	reflect

373	592	1606.61	reflect
374	594	1606.61	reflect
375	595	1606.61	reflect
376	597	1606.61	reflect
377	599	1606.6	expand
378	601	1606.6	expand
379	602	1606.6	reflect
380	603	1606.6	reflect
381	604	1606.6	reflect
382	605	1606.6	reflect
383	607	1606.6	expand
384	608	1606.6	reflect
385	609	1606.6	reflect
386	610	1606.6	reflect
387	612	1606.6	reflect
388	614	1606.59	expand
389	616	1606.59	expand
390	617	1606.59	reflect
391	618	1606.59	reflect
392	619	1606.59	reflect
393	621	1606.58	expand
394	622	1606.58	reflect
395	623	1606.58	reflect
396	625	1606.57	expand
397	626	1606.57	reflect
398	628	1606.56	expand
399	630	1606.55	expand
400	631	1606.55	reflect
401	632	1606.55	reflect
402	633	1606.55	reflect
403	635	1606.52	expand
404	636	1606.52	reflect
405	637	1606.52	reflect
406	638	1606.52	reflect
407	639	1606.52	reflect
408	641	1606.49	expand
409	642	1606.49	reflect
410	643	1606.49	reflect
411	644	1606.49	reflect
412	645	1606.49	reflect
413	647	1606.48	expand
414	648	1606.48	reflect
415	650	1606.45	expand
416	651	1606.45	reflect
417	652	1606.45	reflect
418	653	1606.45	reflect
419	655	1606.44	expand
420	656	1606.44	reflect
421	657	1606.44	reflect
422	659	1606.39	expand
423	660	1606.39	reflect
424	662	1606.36	expand
425	664	1606.33	expand
426	665	1606.33	reflect

427	666	1606.33	reflect
428	668	1606.29	expand
429	669	1606.29	reflect
430	671	1606.21	expand
431	672	1606.21	reflect
432	673	1606.21	reflect
433	675	1606.09	expand
434	676	1606.09	reflect
435	677	1606.09	reflect
436	678	1606.09	reflect
437	679	1606.09	reflect
438	680	1606.09	reflect
439	681	1606.09	reflect
440	683	1606.02	expand
441	685	1605.98	expand
442	686	1605.98	reflect
443	688	1605.84	expand
444	689	1605.84	reflect
445	691	1605.64	expand
446	692	1605.64	reflect
447	693	1605.64	reflect
448	694	1605.64	reflect
449	696	1605.23	expand
450	697	1605.23	reflect
451	698	1605.23	reflect
452	699	1605.23	reflect
453	701	1604.96	expand
454	702	1604.96	reflect
455	704	1604.49	expand
456	705	1604.49	reflect
457	707	1604.13	expand
458	709	1603.77	expand
459	711	1602.71	expand
460	712	1602.71	reflect
461	714	1602.02	expand
462	715	1602.02	reflect
463	717	1601.32	expand
464	719	1600.73	expand
465	721	1597.13	expand
466	722	1597.13	reflect
467	723	1597.13	reflect
468	724	1597.13	reflect
469	725	1597.13	reflect
470	726	1597.13	reflect
471	728	1596.85	reflect
472	730	1593.58	expand
473	731	1593.58	reflect
474	732	1593.58	reflect
475	734	1593.21	reflect
476	736	1587.68	expand
477	737	1587.68	reflect
478	739	1585.89	expand
479	740	1585.89	reflect
480	742	1582.55	expand

481	744	1574.17	expand
482	745	1574.17	reflect
483	746	1574.17	reflect
484	747	1574.17	reflect
485	748	1574.17	reflect
486	750	1561.95	expand
487	751	1561.95	reflect
488	753	1550.47	expand
489	754	1550.47	reflect
490	755	1550.47	reflect
491	757	1548.3	expand
492	759	1523.72	expand
493	760	1523.72	reflect
494	762	1509.23	expand
495	763	1509.23	reflect
496	764	1509.23	reflect
497	765	1509.23	reflect
498	767	1462.62	expand
499	768	1462.62	reflect
500	769	1462.62	reflect
501	770	1462.62	reflect
502	771	1462.62	reflect
503	773	1457.28	reflect
504	775	1456.05	reflect
505	777	1444.06	reflect
506	779	1441.96	reflect
507	781	1440.16	reflect
508	783	1438.08	reflect
509	784	1438.08	reflect
510	786	1436.45	reflect
511	787	1436.45	reflect
512	788	1436.45	reflect
513	790	1435.6	contract inside
514	791	1435.6	reflect
515	793	1435.37	contract inside
516	794	1435.37	reflect
517	795	1435.37	reflect
518	796	1435.37	reflect
519	798	1433.83	reflect
520	799	1433.83	reflect
521	801	1432.86	contract inside
522	803	1432.77	contract inside
523	805	1432.67	contract inside
524	806	1432.67	reflect
525	808	1432.12	contract inside
526	810	1432.02	contract inside
527	812	1431.38	contract inside
528	814	1430.64	reflect
529	816	1430.64	contract inside
530	817	1430.64	reflect
531	819	1430.51	reflect
532	820	1430.51	reflect
533	821	1430.51	reflect
534	822	1430.51	reflect

535	824	1430.46	contract inside
536	826	1429.87	reflect
537	827	1429.87	reflect
538	828	1429.87	reflect
539	829	1429.87	reflect
540	831	1429.87	contract outside
541	833	1429.57	reflect
542	835	1429.16	reflect
543	836	1429.16	reflect
544	837	1429.16	reflect
545	838	1429.16	reflect
546	839	1429.16	reflect
547	840	1429.16	reflect
548	842	1428.75	reflect
549	844	1428.75	contract inside
550	846	1428.61	reflect
551	847	1428.61	reflect
552	848	1428.61	reflect
553	850	1428.61	contract inside
554	851	1428.61	reflect
555	853	1428.61	contract inside
556	855	1428.39	reflect
557	857	1428.39	contract inside
558	859	1428.17	expand
559	860	1428.17	reflect
560	861	1428.17	reflect
561	862	1428.17	reflect
562	863	1428.17	reflect
563	865	1428.01	reflect
564	867	1428.01	contract outside
565	868	1428.01	reflect
566	870	1428.01	contract inside
567	871	1428.01	reflect
568	873	1428.01	contract inside
569	875	1427.98	reflect
570	877	1427.98	contract inside
571	878	1427.98	reflect
572	880	1427.93	reflect
573	881	1427.93	reflect
574	882	1427.93	reflect
575	883	1427.93	reflect
576	884	1427.93	reflect
577	885	1427.93	reflect
578	887	1427.93	contract inside
579	889	1427.93	contract inside
580	891	1427.93	contract inside
581	893	1427.89	reflect
582	895	1427.89	contract inside
583	896	1427.89	reflect
584	897	1427.89	reflect
585	899	1427.87	reflect
586	901	1427.87	contract inside
587	902	1427.87	reflect
588	903	1427.87	reflect

589	905	1427.78	expand
590	906	1427.78	reflect
591	907	1427.78	reflect
592	908	1427.78	reflect
593	909	1427.78	reflect
594	910	1427.78	reflect
595	912	1427.77	reflect
596	914	1427.75	reflect
597	916	1427.73	expand
598	918	1427.69	expand
599	919	1427.69	reflect
600	921	1427.67	reflect
601	923	1427.59	expand
602	925	1427.51	expand
603	927	1427.51	contract inside
604	928	1427.51	reflect
605	929	1427.51	reflect
606	931	1427.39	expand
607	932	1427.39	reflect
608	934	1427.39	reflect
609	936	1427.27	expand
610	937	1427.27	reflect
611	939	1427.21	expand
612	941	1427.15	reflect
613	943	1427.14	reflect
614	944	1427.14	reflect
615	946	1427.08	reflect
616	947	1427.08	reflect
617	948	1427.08	reflect
618	950	1427.08	contract outside
619	952	1427.08	contract inside
620	953	1427.08	reflect
621	954	1427.08	reflect
622	955	1427.08	reflect
623	956	1427.08	reflect
624	958	1427.05	reflect
625	959	1427.05	reflect
626	960	1427.05	reflect
627	962	1427.05	contract inside
628	963	1427.05	reflect
629	965	1427.05	contract outside
630	966	1427.05	reflect
631	967	1427.05	reflect
632	969	1427.05	contract inside
633	970	1427.05	reflect
634	972	1427.05	contract outside
635	973	1427.05	reflect
636	975	1427.04	contract inside
637	976	1427.04	reflect
638	978	1427.04	contract inside
639	980	1427.04	contract inside
640	982	1427.04	contract inside
641	984	1427.04	contract inside
642	986	1427.04	contract inside

643	988	1427.04	contract outside
644	989	1427.04	reflect
645	990	1427.04	reflect
646	992	1427.04	contract inside
647	994	1427.04	contract outside
648	996	1427.04	contract inside
649	997	1427.04	reflect
650	999	1427.04	contract inside
651	1001	1427.04	contract outside
652	1003	1427.04	contract inside
653	1005	1427.04	contract inside
654	1007	1427.04	contract outside
655	1008	1427.04	reflect
656	1010	1427.04	contract inside
657	1012	1427.04	contract inside
658	1014	1427.04	contract outside
659	1016	1427.04	contract outside
660	1018	1427.04	contract inside
661	1020	1427.04	contract inside
662	1021	1427.04	reflect
663	1023	1427.04	contract inside
664	1025	1427.04	contract inside
665	1026	1427.04	reflect
666	1027	1427.04	reflect
667	1029	1427.04	contract inside
668	1030	1427.04	reflect
669	1031	1427.04	reflect
670	1033	1427.04	contract inside
671	1035	1427.04	contract inside
672	1037	1427.04	contract inside
673	1039	1427.04	reflect
674	1041	1427.04	contract inside
675	1042	1427.04	reflect
676	1044	1427.04	contract inside
677	1046	1427.04	contract inside
678	1048	1427.04	contract inside
679	1049	1427.04	reflect
680	1050	1427.04	reflect
681	1052	1427.04	contract inside
682	1054	1427.04	contract inside
683	1056	1427.04	contract inside
684	1058	1427.04	contract inside
685	1060	1427.04	contract inside
686	1062	1427.04	contract inside
687	1064	1427.04	reflect
688	1066	1427.04	contract outside
689	1067	1427.04	reflect
690	1068	1427.04	reflect
691	1070	1427.04	contract inside
692	1072	1427.04	contract inside
693	1074	1427.04	contract outside
694	1075	1427.04	reflect
695	1077	1427.04	contract inside
696	1079	1427.04	contract inside

```
697        1080           1427.04          reflect
698        1082           1427.04          reflect
699        1084           1427.04          contract inside
700        1086           1427.04          contract outside
701        1087           1427.04          reflect
702        1088           1427.04          reflect
703        1090           1427.04          contract inside
704        1092           1427.04          contract inside
705        1093           1427.04          reflect
706        1094           1427.04          reflect
707        1095           1427.04          reflect
708        1096           1427.04          reflect
709        1098           1427.04          contract inside
710        1100           1427.04          contract inside
711        1102           1427.04          reflect
712        1104           1427.04          contract inside
713        1105           1427.04          reflect
714        1107           1427.04          contract inside
715        1109           1427.04          reflect
```

Optimization terminated:
the current x satisfies the termination criteria using OPTIONS.TolX
of 1.000000e-04
and F(X) satisfies the convergence criteria using OPTIONS.TolFun of
1.000000e-04

```
                                                   First-order
Iteration  Func-count       f(x)        Step-size   optimality
    0           7       2.27191e+16                  1.28e+18
    1          14          14844       7.80339e-19   3.02e+04
```

Local minimum found.

Optimization completed because the size of the gradient is less than
the value of the optimality tolerance.

```
                                     Norm of      First-order
Iteration  Func-count       f(x)        step       optimality
    0           7       3.60034e+31                  2.05e+33
    1          14       4.87253e+30         1        2.78e+32
    2          21       6.59425e+29         1        3.76e+31
    3          28       8.92434e+28    0.999997      5.08e+30
    4          35       1.20778e+28         1        6.88e+29
    5          42       1.63455e+27         1        9.31e+28
    6          49       2.21212e+26         1        1.26e+28
    7          56       2.99378e+25         1        1.71e+27
    8          63       4.05164e+24         1        2.31e+26
    9          70        5.4833e+23    0.999999      3.12e+25
   10          77       7.42084e+22         1        4.23e+24
   11          84        1.0043e+22         1        5.72e+23
   12          91       1.35917e+21         1        7.74e+22
   13          98       1.83944e+20         1        1.05e+22
   14         105       2.48941e+19    0.999999      1.42e+21
```

```
15      112      3.36905e+18      0.999996      1.92e+20
16      119      4.55952e+17      0.99999        2.6e+19
17      126      6.17063e+16      0.999972      3.52e+18
18      133      8.35104e+15      0.999924      4.76e+17
19      140      1.13019e+15      0.999793      6.44e+16
20      147      1.52955e+14      0.999437      8.71e+15
21      154      2.07001e+13      0.998469      1.18e+15
22      161      2.80146e+12      0.995843       1.6e+14
23      168      3.79135e+11      0.988721      2.16e+13
24      175      5.13101e+10      0.969509      2.92e+12
25      182      6.94398e+09      0.918337      3.96e+11
26      189      9.39738e+08      0.786656      5.35e+10
27      196      1.27174e+08      0.477277      7.25e+09
28      203      1.72131e+07      0.131124      9.81e+08
29      210      2.33443e+06      0.838027      1.33e+08
30      217         321884        1.42387        1.8e+07
31      224         49900.6       2.33551       2.43e+06
32      231           13222       4.32861        3.3e+05
33      238         8262.86       6.59164       4.51e+04
34      245         7348.72       7.14272       1.44e+04
35      252         6395.94       4.82428        6.6e+04
36      259         5581.84       0.50108       8.73e+03
37      266         5538.33       0.293065          664
38      273         5537.86       0.0150432        35.7
39      280         5537.84       0.00522195       8.09
40      287         5537.84       0.00135311        3.3
```

Local minimum possible.

lsqnonlin stopped because the final change in the sum of squares
 relative to
its initial value is less than the value of the function tolerance.


```
Iteration    Func-count      min f(x)          Procedure
    0            1        3.60034e+31
    1            7        3.60034e+31         initial simplex
    2            9        7.03791e+29         expand
    3           10        7.03791e+29         reflect
    4           11        7.03791e+29         reflect
    5           12        7.03791e+29         reflect
    6           13        7.03791e+29         reflect
    7           15        3.28276e+28         expand
    8           16        3.28276e+28         reflect
    9           18        2.31938e+27         expand
   10           19        2.31938e+27         reflect
   11           21        1.23411e+25         expand
   12           22        1.23411e+25         reflect
   13           24        4.48734e+21         expand
   14           25        4.48734e+21         reflect
   15           26        4.48734e+21         reflect
   16           28        2.97642e+17         expand
   17           29        2.97642e+17         reflect
   18           31        1.05544e+13         expand
```

```
19          32      1.05544e+13     reflect
20          34      3.4225e+08      expand
21          35      3.4225e+08      reflect
22          37      18398.4         expand
23          38      18398.4         reflect
24          40      7803.81         expand
25          41      7803.81         reflect
26          43      7803            expand
27          45      7803            reflect
28          46      7803            reflect
29          47      7803            reflect
30          48      7803            reflect
31          49      7803            reflect
32          51      7803            contract outside
33          53      7803            contract inside
34          55      7803            reflect
35          57      7803            contract inside
36          59      7803            contract inside
37          60      7803            reflect
38          62      7803            contract inside
39          64      7803            contract inside
40          66      7803            contract inside
41          67      7803            reflect
42          69      7803            contract inside
43          71      7803            contract inside
44          73      7803            contract inside
45          75      7803            contract inside
46          77      7803            contract inside
47          79      7803            contract inside
48          81      7803            contract inside
49          82      7803            reflect
50          83      7803            reflect
51          84      7803            reflect
52          85      7803            reflect
53          87      7803            contract inside
54          88      7803            reflect
55          90      7803            expand
56          91      7803            reflect
57          92      7803            reflect
58          93      7803            reflect
59          95      7803            contract inside
60          96      7803            reflect
61          98      7802.99         expand
62          99      7802.99         reflect
63          100     7802.99         reflect
64          102     7802.97         expand
65          104     7802.83         expand
66          105     7802.83         reflect
67          107     7801.58         expand
68          108     7801.58         reflect
69          110     7800.22         reflect
70          112     7800.22         contract inside
71          113     7800.22         reflect
72          115     7797.77         reflect
```

73	117	7797.77	contract inside
74	119	7797.77	contract inside
75	121	7797.47	reflect
76	123	7797.47	contract inside
77	125	7794.73	expand
78	126	7794.73	reflect
79	128	7794.73	contract inside
80	130	7794.73	contract inside
81	131	7794.73	reflect
82	133	7794.73	contract inside
83	135	7794.73	contract inside
84	136	7794.73	reflect
85	138	7794.73	contract inside
86	140	7794.67	reflect
87	142	7794.67	contract inside
88	144	7794.67	contract inside
89	146	7794.67	contract outside
90	148	7794.6	reflect
91	149	7794.6	reflect
92	151	7794.6	contract inside
93	152	7794.6	reflect
94	154	7794.53	contract inside
95	155	7794.53	reflect
96	156	7794.53	reflect
97	158	7794.51	contract inside
98	160	7794.48	contract inside
99	162	7794.47	contract inside
100	164	7794.31	reflect
101	166	7794.31	contract inside
102	167	7794.31	reflect
103	169	7794.16	expand
104	170	7794.16	reflect
105	171	7794.16	reflect
106	173	7794.08	expand
107	175	7793.86	expand
108	177	7793.86	contract inside
109	179	7793.65	expand
110	180	7793.65	reflect
111	181	7793.65	reflect
112	183	7793.19	expand
113	185	7792.61	expand
114	187	7791.59	expand
115	188	7791.59	reflect
116	189	7791.59	reflect
117	191	7789.37	expand
118	192	7789.37	reflect
119	194	7785.84	expand
120	195	7785.84	reflect
121	196	7785.84	reflect
122	198	7777.78	expand
123	199	7777.78	reflect
124	201	7772.55	expand
125	203	7739.96	expand
126	204	7739.96	reflect

127	*206*	*7688.85*	*expand*
128	*208*	*7642.28*	*reflect*
129	*209*	*7642.28*	*reflect*
130	*211*	*7642.28*	*contract inside*
131	*213*	*7455.37*	*expand*
132	*215*	*7455.37*	*contract inside*
133	*216*	*7455.37*	*reflect*
134	*218*	*7455.37*	*contract inside*
135	*220*	*7455.37*	*contract inside*
136	*221*	*7455.37*	*reflect*
137	*223*	*7447.14*	*expand*
138	*225*	*7447.14*	*contract inside*
139	*227*	*7447.14*	*contract inside*
140	*229*	*7224.21*	*reflect*
141	*231*	*7224.21*	*contract inside*
142	*233*	*7224.21*	*contract inside*
143	*234*	*7224.21*	*reflect*
144	*235*	*7224.21*	*reflect*
145	*237*	*7224.21*	*contract inside*
146	*239*	*7224.21*	*contract inside*
147	*241*	*7224.21*	*contract inside*
148	*242*	*7224.21*	*reflect*
149	*243*	*7224.21*	*reflect*
150	*245*	*7194.42*	*expand*
151	*246*	*7194.42*	*reflect*
152	*247*	*7194.42*	*reflect*
153	*249*	*7069.56*	*expand*
154	*251*	*7043.18*	*reflect*
155	*253*	*7043.18*	*contract inside*
156	*254*	*7043.18*	*reflect*
157	*256*	*7002.66*	*reflect*
158	*257*	*7002.66*	*reflect*
159	*259*	*6811.89*	*expand*
160	*261*	*6811.89*	*contract outside*
161	*263*	*6700.98*	*expand*
162	*265*	*6700.98*	*contract inside*
163	*266*	*6700.98*	*reflect*
164	*267*	*6700.98*	*reflect*
165	*269*	*6640.65*	*reflect*
166	*271*	*6377.34*	*expand*
167	*272*	*6377.34*	*reflect*
168	*273*	*6377.34*	*reflect*
169	*275*	*6114.32*	*expand*
170	*276*	*6114.32*	*reflect*
171	*278*	*5941.25*	*expand*
172	*279*	*5941.25*	*reflect*
173	*280*	*5941.25*	*reflect*
174	*282*	*5855.16*	*reflect*
175	*284*	*5855.16*	*contract inside*
176	*285*	*5855.16*	*reflect*
177	*287*	*5695.46*	*reflect*
178	*289*	*5695.46*	*contract inside*
179	*291*	*5695.46*	*contract outside*
180	*293*	*5695.46*	*contract inside*

181	294	5695.46	reflect
182	295	5695.46	reflect
183	297	5695.46	contract inside
184	299	5695.46	contract inside
185	301	5674.53	reflect
186	303	5674.53	contract inside
187	304	5674.53	reflect
188	306	5660.5	reflect
189	307	5660.5	reflect
190	309	5660.5	contract outside
191	311	5657.45	reflect
192	313	5656.14	contract outside
193	315	5655.64	contract inside
194	317	5655.64	contract inside
195	319	5653.06	contract inside
196	320	5653.06	reflect
197	321	5653.06	reflect
198	323	5650.12	contract inside
199	324	5650.12	reflect
200	326	5649.1	contract inside
201	328	5649.1	contract inside
202	330	5649.1	contract inside
203	332	5649.1	contract inside
204	334	5649.1	contract inside
205	336	5648.7	contract outside
206	338	5648.58	reflect
207	340	5648.33	contract inside
208	342	5648.18	contract inside
209	344	5648.12	contract inside
210	346	5648.12	contract inside
211	348	5647.97	contract inside
212	350	5647.96	contract inside
213	352	5647.89	contract inside
214	354	5647.85	contract outside
215	356	5647.84	contract inside
216	358	5647.83	contract inside
217	360	5647.82	contract outside
218	362	5647.77	contract inside
219	364	5647.77	contract inside
220	365	5647.77	reflect
221	367	5647.75	contract inside
222	369	5647.75	contract inside
223	371	5647.74	contract inside
224	373	5647.74	contract inside
225	375	5647.74	contract inside
226	377	5647.68	expand
227	379	5647.68	contract inside
228	380	5647.68	reflect
229	381	5647.68	reflect
230	382	5647.68	reflect
231	384	5647.63	expand
232	385	5647.63	reflect
233	387	5647.55	expand
234	388	5647.55	reflect

235	389	5647.55	reflect
236	390	5647.55	reflect
237	392	5647.39	expand
238	393	5647.39	reflect
239	394	5647.39	reflect
240	396	5647.32	expand
241	397	5647.32	reflect
242	398	5647.32	reflect
243	399	5647.32	reflect
244	401	5647.21	expand
245	403	5646.79	expand
246	404	5646.79	reflect
247	405	5646.79	reflect
248	406	5646.79	reflect
249	407	5646.79	reflect
250	409	5646.69	expand
251	411	5646.62	reflect
252	413	5645.99	expand
253	414	5645.99	reflect
254	416	5645.62	expand
255	417	5645.62	reflect
256	418	5645.62	reflect
257	420	5644.5	expand
258	421	5644.5	reflect
259	422	5644.5	reflect
260	424	5644.08	expand
261	426	5643.53	expand
262	428	5641.99	expand
263	430	5640.36	expand
264	431	5640.36	reflect
265	433	5637.62	expand
266	434	5637.62	reflect
267	435	5637.62	reflect
268	437	5632.56	expand
269	438	5632.56	reflect
270	439	5632.56	reflect
271	440	5632.56	reflect
272	442	5624.52	expand
273	443	5624.52	reflect
274	444	5624.52	reflect
275	445	5624.52	reflect
276	447	5619.69	expand
277	449	5616.3	expand
278	451	5607.81	expand
279	452	5607.81	reflect
280	453	5607.81	reflect
281	455	5600.31	expand
282	456	5600.31	reflect
283	457	5600.31	reflect
284	458	5600.31	reflect
285	459	5600.31	reflect
286	460	5600.31	reflect
287	461	5600.31	reflect
288	463	5599.55	reflect

289	464	5599.55	reflect
290	466	5599.55	contract inside
291	468	5590.86	expand
292	470	5590.86	contract inside
293	471	5590.86	reflect
294	472	5590.86	reflect
295	473	5590.86	reflect
296	475	5590.86	contract inside
297	476	5590.86	reflect
298	477	5590.86	reflect
299	478	5590.86	reflect
300	479	5590.86	reflect
301	480	5590.86	reflect
302	481	5590.86	reflect
303	483	5589.21	reflect
304	484	5589.21	reflect
305	485	5589.21	reflect
306	487	5589.21	contract outside
307	488	5589.21	reflect
308	489	5589.21	reflect
309	490	5589.21	reflect
310	492	5589.2	contract inside
311	494	5588.93	contract inside
312	496	5588.93	contract inside
313	498	5588.93	contract inside
314	500	5588.93	contract inside
315	501	5588.93	reflect
316	502	5588.93	reflect
317	504	5588.84	contract inside
318	505	5588.84	reflect
319	507	5588.75	reflect
320	509	5588.73	contract inside
321	511	5588.73	contract inside
322	513	5588.73	contract inside
323	514	5588.73	reflect
324	516	5588.73	contract inside
325	518	5588.72	contract inside
326	520	5588.71	reflect
327	522	5588.69	contract inside
328	524	5588.69	contract outside
329	526	5588.68	contract inside
330	528	5588.68	contract inside
331	530	5588.68	contract inside
332	532	5588.67	contract outside
333	534	5588.67	contract inside
334	535	5588.67	reflect
335	537	5588.66	reflect
336	539	5588.66	contract inside
337	541	5588.66	contract inside
338	543	5588.66	contract outside
339	545	5588.66	contract outside
340	546	5588.66	reflect
341	548	5588.66	contract inside
342	550	5588.66	contract inside

343	551	5588.66	reflect
344	553	5588.66	contract inside
345	555	5588.66	contract inside
346	556	5588.66	reflect
347	557	5588.66	reflect
348	559	5588.66	contract inside
349	561	5588.66	contract inside
350	563	5588.66	contract inside
351	565	5588.66	contract inside
352	567	5588.66	contract inside
353	569	5588.66	contract inside
354	571	5588.66	contract inside
355	572	5588.66	reflect
356	574	5588.66	contract inside
357	576	5588.66	contract inside
358	577	5588.66	reflect
359	578	5588.66	reflect
360	580	5588.66	contract inside
361	582	5588.66	contract inside
362	584	5588.66	reflect
363	586	5588.66	reflect
364	587	5588.66	reflect
365	589	5588.66	contract outside
366	590	5588.66	reflect
367	591	5588.66	reflect
368	592	5588.66	reflect
369	594	5588.66	reflect
370	596	5588.66	contract inside
371	597	5588.66	reflect
372	599	5588.66	expand
373	601	5588.66	contract inside
374	602	5588.66	reflect
375	604	5588.66	contract inside
376	606	5588.66	expand
377	608	5588.66	reflect
378	610	5588.66	reflect
379	611	5588.66	reflect
380	613	5588.66	expand
381	614	5588.66	reflect
382	615	5588.66	reflect
383	617	5588.66	reflect
384	618	5588.66	reflect
385	620	5588.66	reflect
386	622	5588.66	expand
387	623	5588.66	reflect
388	625	5588.66	contract inside
389	626	5588.66	reflect
390	628	5588.65	expand
391	629	5588.65	reflect
392	630	5588.65	reflect
393	632	5588.65	expand
394	634	5588.65	expand
395	636	5588.65	expand
396	638	5588.65	expand

397	639	5588.65	reflect
398	640	5588.65	reflect
399	641	5588.65	reflect
400	643	5588.65	expand
401	645	5588.65	expand
402	646	5588.65	reflect
403	647	5588.65	reflect
404	649	5588.64	expand
405	651	5588.64	expand
406	652	5588.64	reflect
407	653	5588.64	reflect
408	655	5588.64	expand
409	657	5588.63	expand
410	659	5588.63	expand
411	661	5588.62	expand
412	662	5588.62	reflect
413	663	5588.62	reflect
414	664	5588.62	reflect
415	665	5588.62	reflect
416	667	5588.61	reflect
417	669	5588.6	expand
418	670	5588.6	reflect
419	672	5588.6	expand
420	673	5588.6	reflect
421	675	5588.57	expand
422	676	5588.57	reflect
423	677	5588.57	reflect
424	678	5588.57	reflect
425	679	5588.57	reflect
426	681	5588.56	expand
427	683	5588.56	expand
428	685	5588.52	expand
429	686	5588.52	reflect
430	687	5588.52	reflect
431	689	5588.48	expand
432	690	5588.48	reflect
433	691	5588.48	reflect
434	693	5588.44	expand
435	694	5588.44	reflect
436	695	5588.44	reflect
437	696	5588.44	reflect
438	698	5588.41	expand
439	700	5588.4	reflect
440	701	5588.4	reflect
441	703	5588.32	expand
442	704	5588.32	reflect
443	705	5588.32	reflect
444	706	5588.32	reflect
445	707	5588.32	reflect
446	708	5588.32	reflect
447	710	5588.28	reflect
448	712	5588.27	expand
449	713	5588.27	reflect
450	715	5588.27	reflect

451	*717*	*5588.26*	*reflect*
452	*719*	*5588.26*	*reflect*
453	*720*	*5588.26*	*reflect*
454	*722*	*5588.23*	*reflect*
455	*724*	*5588.23*	*contract outside*
456	*726*	*5588.17*	*expand*
457	*728*	*5588.17*	*contract inside*
458	*729*	*5588.17*	*reflect*
459	*730*	*5588.17*	*reflect*
460	*731*	*5588.17*	*reflect*
461	*732*	*5588.17*	*reflect*
462	*733*	*5588.17*	*reflect*
463	*734*	*5588.17*	*reflect*
464	*736*	*5588.11*	*expand*
465	*737*	*5588.11*	*reflect*
466	*738*	*5588.11*	*reflect*
467	*739*	*5588.11*	*reflect*
468	*741*	*5588.06*	*expand*
469	*743*	*5588*	*expand*
470	*744*	*5588*	*reflect*
471	*745*	*5588*	*reflect*
472	*747*	*5587.93*	*expand*
473	*749*	*5587.76*	*expand*
474	*750*	*5587.76*	*reflect*
475	*751*	*5587.76*	*reflect*
476	*752*	*5587.76*	*reflect*
477	*754*	*5587.59*	*expand*
478	*756*	*5587.34*	*expand*
479	*757*	*5587.34*	*reflect*
480	*758*	*5587.34*	*reflect*
481	*759*	*5587.34*	*reflect*
482	*761*	*5587.09*	*expand*
483	*763*	*5587.07*	*reflect*
484	*765*	*5586.8*	*expand*
485	*767*	*5586.32*	*expand*
486	*768*	*5586.32*	*reflect*
487	*769*	*5586.32*	*reflect*
488	*770*	*5586.32*	*reflect*
489	*772*	*5585.99*	*expand*
490	*774*	*5585.29*	*expand*
491	*775*	*5585.29*	*reflect*
492	*777*	*5584.29*	*expand*
493	*778*	*5584.29*	*reflect*
494	*779*	*5584.29*	*reflect*
495	*781*	*5584.27*	*reflect*
496	*783*	*5582.37*	*expand*
497	*784*	*5582.37*	*reflect*
498	*786*	*5580.62*	*expand*
499	*787*	*5580.62*	*reflect*
500	*788*	*5580.62*	*reflect*
501	*789*	*5580.62*	*reflect*
502	*791*	*5578.65*	*expand*
503	*793*	*5576.71*	*expand*
504	*794*	*5576.71*	*reflect*

505	796	5574.21	expand
506	797	5574.21	reflect
507	798	5574.21	reflect
508	799	5574.21	reflect
509	801	5569.68	expand
510	802	5569.68	reflect
511	803	5569.68	reflect
512	804	5569.68	reflect
513	805	5569.68	reflect
514	806	5569.68	reflect
515	807	5569.68	reflect
516	809	5567.4	expand
517	810	5567.4	reflect
518	811	5567.4	reflect
519	813	5566.74	reflect
520	815	5566.74	contract inside
521	817	5566.41	reflect
522	818	5566.41	reflect
523	820	5566.07	reflect
524	822	5566.07	contract inside
525	823	5566.07	reflect
526	824	5566.07	reflect
527	826	5565.98	reflect
528	828	5565.98	contract inside
529	830	5565.98	contract inside
530	832	5565.77	reflect
531	833	5565.77	reflect
532	835	5565.77	reflect
533	837	5565.77	contract inside
534	838	5565.77	reflect
535	839	5565.77	reflect
536	841	5565.72	contract inside
537	843	5565.68	contract inside
538	845	5565.68	contract inside
539	847	5565.68	contract inside
540	848	5565.68	reflect
541	850	5565.66	contract inside
542	851	5565.66	reflect
543	853	5565.65	contract inside
544	855	5565.65	contract inside
545	856	5565.65	reflect
546	858	5565.64	contract inside
547	860	5565.64	contract inside
548	862	5565.64	contract inside
549	864	5565.64	contract inside
550	866	5565.63	contract outside
551	868	5565.63	contract inside
552	870	5565.63	contract inside
553	872	5565.63	contract inside
554	873	5565.63	reflect
555	875	5565.63	contract inside
556	877	5565.63	contract inside
557	879	5565.63	contract inside
558	881	5565.63	contract inside

```
559        883        5565.63        contract inside
560        884        5565.63        reflect
561        886        5565.63        contract outside
562        888        5565.63        contract inside
563        890        5565.63        contract inside
564        892        5565.63        reflect
565        894        5565.63        contract inside
566        896        5565.63        contract inside
567        898        5565.63        contract inside
568        900        5565.63        contract outside
569        901        5565.63        reflect
570        903        5565.63        contract inside
571        904        5565.63        reflect
572        906        5565.63        reflect
573        908        5565.63        contract inside
574        909        5565.63        reflect
575        911        5565.63        contract inside
576        912        5565.63        reflect
577        914        5565.63        contract inside
578        916        5565.63        contract inside
579        917        5565.63        reflect
580        919        5565.63        contract inside
581        921        5565.63        contract inside
582        923        5565.63        contract inside
583        925        5565.63        contract inside
584        926        5565.63        reflect
585        928        5565.63        contract inside
586        930        5565.63        contract inside
587        932        5565.63        contract inside
588        934        5565.63        contract inside
589        936        5565.63        contract outside
590        938        5565.63        contract inside
591        940        5565.63        contract inside
592        942        5565.63        contract inside
593        944        5565.63        contract inside
594        946        5565.63        contract inside
595        948        5565.63        contract inside
596        950        5565.63        contract inside
597        952        5565.63        contract outside
598        954        5565.63        contract inside
599        956        5565.63        contract inside
```

Optimization terminated:
 the current x satisfies the termination criteria using OPTIONS.TolX
 of 1.000000e-04
 and F(X) satisfies the convergence criteria using OPTIONS.TolFun of
 1.000000e-04


```
Iteration    Func-count      min f(x)          Procedure
    0            1         1.64907e+39
    1            7         1.64907e+39        initial simplex
    2            9         1.20883e+37        expand
    3           10         1.20883e+37        reflect
```

```
 4        11        1.20883e+37        reflect
 5        12        1.20883e+37        reflect
 6        13        1.20883e+37        reflect
 7        15        2.62378e+35        expand
 8        16        2.62378e+35        reflect
 9        18        9.47399e+33        expand
10        19        9.47399e+33        reflect
11        21         1.3608e+31        expand
12        22         1.3608e+31        reflect
13        24        6.66036e+26        expand
14        25        6.66036e+26        reflect
15        26        6.66036e+26        reflect
16        28        3.38312e+21        expand
17        29        3.38312e+21        reflect
18        31        6.91865e+15        expand
19        32        6.91865e+15        reflect
20        34        2.35085e+10        expand
21        35        2.35085e+10        reflect
22        37            119420        expand
23        38            119420        reflect
24        40           31495.5        expand
25        42           22472.7        reflect
26        43           22472.7        reflect
27        44           22472.7        reflect
28        45           22472.7        reflect
29        46           22472.7        reflect
30        48           22472.7        contract outside
31        50           19381.2        reflect
32        52           19381.2        contract inside
33        54           19381.2        contract inside
34        55           19381.2        reflect
35        57           19381.2        contract inside
36        59           19381.2        contract inside
37        61           19296.3        reflect
38        62           19296.3        reflect
39        64           19296.3        contract inside
40        66           19296.3        contract inside
41        68           19296.3        contract outside
42        69           19296.3        reflect
43        71           19296.3        contract inside
44        73           19296.3        contract inside
45        74           19296.3        reflect
46        76           19296.3        contract inside
47        78           19296.3        contract inside
48        80           19296.3        contract inside
49        82           19296.3        contract inside
50        83           19296.3        reflect
51        85           19296.3        contract inside
52        87           19296.3        contract inside
53        88           19296.3        reflect
54        90           19296.3        contract inside
55        92           19166.6        reflect
56        94           19146.3        reflect
57        95           19146.3        reflect
```

58	97	19093.5	reflect
59	99	18857.1	expand
60	101	18857.1	contract inside
61	103	18432.7	expand
62	104	18432.7	reflect
63	105	18432.7	reflect
64	106	18432.7	reflect
65	107	18432.7	reflect
66	109	17995	expand
67	110	17995	reflect
68	111	17995	reflect
69	112	17995	reflect
70	114	17345.3	expand
71	115	17345.3	reflect
72	116	17345.3	reflect
73	117	17345.3	reflect
74	119	16325.2	expand
75	120	16325.2	reflect
76	122	15341.3	expand
77	123	15341.3	reflect
78	124	15341.3	reflect
79	126	14477.6	expand
80	128	12423.8	expand
81	129	12423.8	reflect
82	131	9747.96	expand
83	132	9747.96	reflect
84	133	9747.96	reflect
85	135	9747.96	contract inside
86	137	9008.78	expand
87	139	9008.78	contract outside
88	141	8198.12	expand
89	143	8198.12	contract inside
90	145	7880.22	reflect
91	146	7880.22	reflect
92	147	7880.22	reflect
93	149	7880.22	contract inside
94	151	7375.5	reflect
95	153	7375.5	contract outside
96	155	7175.42	contract inside
97	156	7175.42	reflect
98	157	7175.42	reflect
99	159	7175.42	contract inside
100	161	7175.42	contract inside
101	163	7175.42	contract inside
102	165	7175.42	contract inside
103	167	7175.42	contract outside
104	169	7175.42	contract inside
105	171	7175.42	contract inside
106	173	7175.42	contract inside
107	175	7175.42	contract inside
108	177	7175.42	contract inside
109	179	7175.42	contract inside
110	181	7158.54	reflect
111	183	7158.54	contract outside

112	185	7158.54	contract inside
113	186	7158.54	reflect
114	188	7158.54	contract inside
115	190	7151.68	reflect
116	192	7150.02	contract inside
117	194	7128.98	expand
118	195	7128.98	reflect
119	196	7128.98	reflect
120	198	7127.83	reflect
121	200	7108.7	expand
122	201	7108.7	reflect
123	202	7108.7	reflect
124	204	7068.59	expand
125	206	7068.59	contract outside
126	207	7068.59	reflect
127	209	7023.18	expand
128	210	7023.18	reflect
129	211	7023.18	reflect
130	213	6995.4	expand
131	215	6973.17	expand
132	217	6931.38	expand
133	219	6816.36	expand
134	220	6816.36	reflect
135	221	6816.36	reflect
136	222	6816.36	reflect
137	224	6770.71	expand
138	226	6589.91	expand
139	227	6589.91	reflect
140	228	6589.91	reflect
141	229	6589.91	reflect
142	231	6342.02	expand
143	232	6342.02	reflect
144	233	6342.02	reflect
145	235	6195.73	expand
146	236	6195.73	reflect
147	237	6195.73	reflect
148	238	6195.73	reflect
149	239	6195.73	reflect
150	241	6173.39	reflect
151	243	6173.39	contract inside
152	244	6173.39	reflect
153	246	6172.74	contract inside
154	248	6168.68	reflect
155	249	6168.68	reflect
156	251	6096.77	reflect
157	253	6096.77	contract inside
158	254	6096.77	reflect
159	256	6066.15	expand
160	258	6066.15	contract inside
161	259	6066.15	reflect
162	260	6066.15	reflect
163	261	6066.15	reflect
164	263	6066.15	contract inside
165	265	6066.15	contract inside

```
166        267        6021.38        expand
167        269        5971.56        expand
168        271        5971.56        contract inside
169        272        5971.56        reflect
170        274        5965.42        expand
171        276        5906.34        expand
172        278        5900.44        reflect
173        279        5900.44        reflect
174        281        5811.05        expand
175        282        5811.05        reflect
176        284        5811.05        contract inside
177        286        5743.81        expand
178        288         5647.1        expand
179        289         5647.1        reflect
180        291        5616.32        expand
181        292        5616.32        reflect
182        294        5294.12        expand
183        295        5294.12        reflect
184        297        5041.04        expand
185        298        5041.04        reflect
186        300        4775.66        expand
187        301        4775.66        reflect
188        303        4238.08        expand
189        304        4238.08        reflect
190        306        3703.32        expand
191        307        3703.32        reflect
192        309        3340.09        expand
193        310        3340.09        reflect
194        312        3166.23        reflect
195        314        3127.12        reflect
196        316        2231.62        expand
197        317        2231.62        reflect
198        318        2231.62        reflect
199        319        2231.62        reflect
200        321        2231.62        contract outside
201        322        2231.62        reflect
202        323        2231.62        reflect
203        325        1704.14        expand
204        326        1704.14        reflect
205        327        1704.14        reflect
206        328        1704.14        reflect
207        329        1704.14        reflect
208        330        1704.14        reflect
209        332        1704.14        contract inside
210        334        1704.14        contract inside
211        336        1665.82        reflect
212        338        1665.82        contract outside
213        339        1665.82        reflect
214        340        1665.82        reflect
215        342        1665.82        contract inside
216        344        1651.91        contract inside
217        345        1651.91        reflect
218        347        1651.91        contract inside
219        349        1651.34        reflect
```

220	351	1647.14	contract inside
221	352	1647.14	reflect
222	354	1636.05	contract outside
223	355	1636.05	reflect
224	357	1636.05	contract inside
225	359	1635.44	contract inside
226	360	1635.44	reflect
227	361	1635.44	reflect
228	363	1628.57	contract inside
229	365	1628.57	contract inside
230	367	1628.03	contract inside
231	369	1624.78	contract inside
232	371	1621.26	reflect
233	373	1621.26	contract inside
234	374	1621.26	reflect
235	375	1621.26	reflect
236	377	1621.24	contract inside
237	379	1620.9	contract inside
238	381	1620.1	contract inside
239	383	1619.41	contract inside
240	385	1619.22	contract inside
241	387	1619.22	contract inside
242	389	1619.16	contract inside
243	390	1619.16	reflect
244	391	1619.16	reflect
245	393	1619.03	contract inside
246	395	1619.03	contract inside
247	397	1618.91	contract inside
248	399	1618.84	contract inside
249	401	1618.81	contract inside
250	403	1618.68	contract inside
251	405	1618.68	contract inside
252	406	1618.68	reflect
253	408	1618.68	contract inside
254	410	1618.68	contract inside
255	412	1618.68	contract inside
256	414	1618.63	reflect
257	415	1618.63	reflect
258	417	1618.59	contract inside
259	418	1618.59	reflect
260	419	1618.59	reflect
261	421	1618.59	contract inside
262	423	1618.58	contract inside
263	425	1618.57	reflect
264	427	1618.57	reflect
265	429	1618.55	contract inside
266	431	1618.55	contract inside
267	433	1618.52	reflect
268	434	1618.52	reflect
269	436	1618.46	expand
270	438	1618.46	contract inside
271	440	1618.46	contract inside
272	441	1618.46	reflect
273	443	1618.38	expand

274	444	1618.38	reflect
275	445	1618.38	reflect
276	447	1618.34	expand
277	449	1618.33	reflect
278	451	1618.29	expand
279	453	1618.19	expand
280	455	1617.9	expand
281	456	1617.9	reflect
282	457	1617.9	reflect
283	458	1617.9	reflect
284	460	1617.87	reflect
285	462	1617.61	expand
286	464	1617.2	expand
287	465	1617.2	reflect
288	466	1617.2	reflect
289	468	1616.76	expand
290	470	1616.35	expand
291	471	1616.35	reflect
292	473	1615.92	expand
293	475	1614.54	expand
294	476	1614.54	reflect
295	477	1614.54	reflect
296	479	1613.04	expand
297	480	1613.04	reflect
298	482	1611.44	expand
299	484	1609.53	expand
300	485	1609.53	reflect
301	486	1609.53	reflect
302	488	1607.97	expand
303	490	1602.64	expand
304	491	1602.64	reflect
305	492	1602.64	reflect
306	493	1602.64	reflect
307	495	1598.49	expand
308	496	1598.49	reflect
309	498	1592.89	expand
310	499	1592.89	reflect
311	500	1592.89	reflect
312	502	1589.95	expand
313	503	1589.95	reflect
314	505	1585.32	expand
315	507	1580.64	expand
316	508	1580.64	reflect
317	510	1576.46	expand
318	511	1576.46	reflect
319	512	1576.46	reflect
320	513	1576.46	reflect
321	515	1571.73	expand
322	517	1566.11	expand
323	519	1563.97	expand
324	521	1563.7	reflect
325	523	1545.65	expand
326	524	1545.65	reflect
327	526	1543.62	reflect

328	528	1537.56	reflect
329	530	1537.56	contract inside
330	531	1537.56	reflect
331	533	1531.56	reflect
332	534	1531.56	reflect
333	535	1531.56	reflect
334	536	1531.56	reflect
335	538	1527.47	reflect
336	540	1525.95	reflect
337	541	1525.95	reflect
338	542	1525.95	reflect
339	544	1519.8	reflect
340	545	1519.8	reflect
341	547	1517.4	reflect
342	548	1517.4	reflect
343	550	1515.8	reflect
344	552	1498.71	expand
345	553	1498.71	reflect
346	554	1498.71	reflect
347	555	1498.71	reflect
348	556	1498.71	reflect
349	558	1490.89	expand
350	560	1489.96	reflect
351	562	1486.99	reflect
352	563	1486.99	reflect
353	565	1485.59	reflect
354	567	1485.59	contract inside
355	569	1464.5	expand
356	570	1464.5	reflect
357	571	1464.5	reflect
358	573	1450.84	expand
359	574	1450.84	reflect
360	575	1450.84	reflect
361	576	1450.84	reflect
362	578	1444.1	reflect
363	580	1438.16	reflect
364	582	1435.11	reflect
365	583	1435.11	reflect
366	584	1435.11	reflect
367	585	1435.11	reflect
368	586	1435.11	reflect
369	588	1431.68	reflect
370	590	1431.68	contract inside
371	592	1430.87	reflect
372	594	1430.77	contract inside
373	596	1430.77	contract inside
374	597	1430.77	reflect
375	599	1430.36	contract inside
376	601	1430.01	contract inside
377	603	1428.27	reflect
378	604	1428.27	reflect
379	605	1428.27	reflect
380	607	1428.26	contract inside
381	609	1428.24	contract inside

382	611	1428.01	contract inside
383	613	1427.64	reflect
384	615	1427.64	contract inside
385	617	1427.55	contract inside
386	619	1427.39	contract inside
387	620	1427.39	reflect
388	621	1427.39	reflect
389	623	1427.3	contract inside
390	625	1427.29	contract inside
391	627	1427.17	contract inside
392	629	1427.17	contract inside
393	631	1427.17	contract inside
394	633	1427.17	contract inside
395	635	1427.15	contract outside
396	636	1427.15	reflect
397	637	1427.15	reflect
398	639	1427.13	contract outside
399	641	1427.12	contract inside
400	643	1427.11	contract inside
401	645	1427.11	contract inside
402	647	1427.11	contract inside
403	649	1427.09	contract inside
404	651	1427.09	contract inside
405	652	1427.09	reflect
406	653	1427.09	reflect
407	655	1427.09	contract inside
408	657	1427.09	contract inside
409	659	1427.09	contract inside
410	661	1427.09	contract inside
411	663	1427.09	contract outside
412	664	1427.09	reflect
413	666	1427.08	contract inside
414	668	1427.08	contract inside
415	670	1427.08	contract inside
416	671	1427.08	reflect
417	672	1427.08	reflect
418	674	1427.08	contract inside
419	675	1427.08	reflect
420	677	1427.08	contract inside
421	679	1427.08	contract inside
422	681	1427.08	contract inside
423	683	1427.08	contract outside
424	685	1427.08	contract inside
425	686	1427.08	reflect
426	687	1427.08	reflect
427	689	1427.08	reflect
428	690	1427.08	reflect
429	692	1427.08	contract inside
430	694	1427.08	contract inside
431	695	1427.08	reflect
432	697	1427.08	contract inside
433	699	1427.08	contract inside
434	701	1427.08	contract inside
435	703	1427.08	contract inside

```
436         705         1427.08         contract outside
437         706         1427.08         reflect
438         708         1427.08         contract inside
439         710         1427.08         contract outside
440         712         1427.08         contract inside
441         714         1427.08         contract inside
442         716         1427.08         contract inside
443         718         1427.08         contract inside
444         720         1427.08         contract outside
445         722         1427.08         contract inside
446         724         1427.08         contract inside
447         726         1427.08         contract inside
448         728         1427.08         contract inside
449         730         1427.08         contract inside
450         732         1427.08         contract inside
```

Optimization terminated:
the current x satisfies the termination criteria using OPTIONS.TolX
of 1.000000e-04
and F(X) satisfies the convergence criteria using OPTIONS.TolFun of
1.000000e-04

Iteration	Func-count	f(x)	Step-size	First-order optimality
0	7	1.64907e+39		9.4e+40
1	14	7.1555e+12	1.06401e-41	3.13e+14

Local minimum found.

Optimization completed because the size of the gradient is less than
the value of the optimality tolerance.

Iteration	Func-count	f(x)	Norm of step	First-order optimality
0	7	4.97197e+77		2.83e+79
1	14	6.72883e+76	0.939503	3.84e+78
2	21	9.10648e+75	0.964848	5.19e+77
3	28	1.23243e+75	0.999912	7.02e+76
4	35	1.66791e+74	0.860955	9.51e+75
5	42	2.25727e+73	1.02316	1.29e+75
6	49	3.05488e+72	0.916985	1.74e+74
7	56	4.13433e+71	1.06488	2.36e+73
8	63	5.59521e+70	0.972493	3.19e+72
9	70	7.5723e+69	0.901302	4.32e+71
10	77	1.0248e+69	0.958996	5.84e+70
11	84	1.38691e+68	1.00001	7.91e+69
12	91	1.87698e+67	0.955334	1.07e+69
13	98	2.54022e+66	0.950826	1.45e+68
14	105	3.43781e+65	0.965521	1.96e+67
15	112	4.65257e+64	0.924024	2.65e+66
16	119	6.29657e+63	1.01308	3.59e+65
17	126	8.52149e+62	0.976797	4.86e+64
18	133	1.15326e+62	0.950353	6.57e+63

19	*140*	*1.56076e+61*	*0.971006*	*8.9e+62*
20	*147*	*2.11226e+60*	*1.03158*	*1.2e+62*
21	*154*	*2.85864e+59*	*0.917335*	*1.63e+61*
22	*161*	*3.86874e+58*	*0.979025*	*2.21e+60*
23	*168*	*5.23577e+57*	*0.924229*	*2.98e+59*
24	*175*	*7.08585e+56*	*1.0057*	*4.04e+58*
25	*182*	*9.58965e+55*	*1.02257*	*5.47e+57*
26	*189*	*1.29782e+55*	*0.966891*	*7.4e+56*
27	*196*	*1.7564e+54*	*0.995784*	*1e+56*
28	*203*	*2.37703e+53*	*0.992248*	*1.35e+55*
29	*210*	*3.21696e+52*	*1.01421*	*1.83e+54*
30	*217*	*4.35369e+51*	*0.973353*	*2.48e+53*
31	*224*	*5.89207e+50*	*1.01196*	*3.36e+52*
32	*231*	*7.97405e+49*	*0.950189*	*4.55e+51*
33	*238*	*1.07917e+49*	*0.931406*	*6.15e+50*
34	*245*	*1.4605e+48*	*0.983175*	*8.32e+49*
35	*252*	*1.97657e+47*	*0.969473*	*1.13e+49*
36	*259*	*2.67499e+46*	*0.98673*	*1.52e+48*
37	*266*	*3.6202e+45*	*0.950292*	*2.06e+47*
38	*273*	*4.89941e+44*	*1.01091*	*2.79e+46*
39	*280*	*6.63063e+43*	*0.969485*	*3.78e+45*
40	*287*	*8.97357e+42*	*0.963624*	*5.11e+44*
41	*294*	*1.21444e+42*	*1*	*6.92e+43*
42	*301*	*1.64357e+41*	*0.981342*	*9.37e+42*
43	*308*	*2.22432e+40*	*0.996621*	*1.27e+42*
44	*315*	*3.01029e+39*	*0.984453*	*1.72e+41*
45	*322*	*4.07398e+38*	*0.988719*	*2.32e+40*
46	*329*	*5.51353e+37*	*1.01547*	*3.14e+39*
47	*336*	*7.46175e+36*	*1*	*4.25e+38*
48	*343*	*1.00984e+36*	*0.964231*	*5.76e+37*
49	*350*	*1.36667e+35*	*0.976148*	*7.79e+36*
50	*357*	*1.84958e+34*	*1.00716*	*1.05e+36*
51	*364*	*2.50313e+33*	*0.993338*	*1.43e+35*
52	*371*	*3.38762e+32*	*0.966392*	*1.93e+34*
53	*378*	*4.58464e+31*	*0.986387*	*2.61e+33*
54	*385*	*6.20463e+30*	*0.98513*	*3.54e+32*
55	*392*	*8.39705e+29*	*1.01352*	*4.79e+31*
56	*399*	*1.13642e+29*	*0.987332*	*6.48e+30*
57	*406*	*1.53797e+28*	*0.984609*	*8.77e+29*
58	*413*	*2.08142e+27*	*0.961544*	*1.19e+29*
59	*420*	*2.81689e+26*	*0.975205*	*1.61e+28*
60	*427*	*3.81224e+25*	*1.00836*	*2.17e+27*
61	*434*	*5.1593e+24*	*0.98701*	*2.94e+26*
62	*441*	*6.98235e+23*	*0.985801*	*3.98e+25*
63	*448*	*9.44957e+22*	*0.987082*	*5.39e+24*
64	*455*	*1.27886e+22*	*0.984309*	*7.29e+23*
65	*462*	*1.73075e+21*	*1*	*9.87e+22*
66	*469*	*2.34231e+20*	*0.980254*	*1.34e+22*
67	*476*	*3.16997e+19*	*0.991072*	*1.81e+21*
68	*483*	*4.29008e+18*	*0.967323*	*2.45e+20*
69	*490*	*5.80599e+17*	*0.975712*	*3.31e+19*
70	*497*	*7.85754e+16*	*0.925679*	*4.48e+18*
71	*504*	*1.0634e+16*	*0.794925*	*6.06e+17*
72	*511*	*1.43916e+15*	*0.549613*	*8.2e+16*

73	518	1.94769e+14	0.0986081	1.11e+16
74	525	2.63591e+13	0.545281	1.5e+15
75	532	3.56732e+12	0.850084	2.03e+14
76	539	4.82785e+11	0.884738	2.75e+13
77	546	6.53378e+10	0.889373	3.72e+12
78	553	8.8425e+09	0.898907	5.04e+11
79	560	1.1967e+09	0.924682	6.82e+10
80	567	1.61958e+08	0.99448	9.23e+09
81	574	2.19238e+07	1.1821	1.25e+09
82	581	2.97312e+06	1.67557	1.69e+08
83	588	408765	2.89646	2.29e+07
84	595	61844.7	5.45837	3.1e+06
85	602	14939.9	8.01095	4.19e+05

Solver stopped prematurely.

lsqnonlin stopped because it exceeded the function evaluation limit,
options.MaxFunctionEvaluations = 6.000000e+02.

Iteration	Func-count	min f(x)	Procedure
0	1	4.97197e+77	
1	7	4.97197e+77	initial simplex
2	9	2.72814e+73	expand
3	10	2.72814e+73	reflect
4	11	2.72814e+73	reflect
5	12	2.72814e+73	reflect
6	13	2.72814e+73	reflect
7	15	1.30523e+70	expand
8	16	1.30523e+70	reflect
9	18	1.66696e+67	expand
10	19	1.66696e+67	reflect
11	21	3.48034e+61	expand
12	22	3.48034e+61	reflect
13	24	8.33104e+52	expand
14	25	8.33104e+52	reflect
15	26	8.33104e+52	reflect
16	28	1.59929e+42	expand
17	29	1.59929e+42	reflect
18	31	1.8179e+30	expand
19	32	1.8179e+30	reflect
20	34	1.28474e+20	expand
21	35	1.28474e+20	reflect
22	37	1.17414e+10	expand
23	38	1.17414e+10	reflect
24	40	7803.94	expand
25	41	7803.94	reflect
26	43	7803	expand
27	44	7803	reflect
28	45	7803	reflect
29	46	7803	reflect
30	47	7803	reflect
31	48	7803	reflect
32	49	7803	reflect

33	51	7803	contract outside
34	59	7803	shrink
35	67	7803	shrink
36	68	7803	reflect
37	70	7803	reflect
38	78	7803	shrink
39	79	7803	reflect
40	81	7803	contract inside
41	82	7803	reflect
42	84	7803	contract inside
43	85	7803	reflect
44	87	7803	contract inside
45	89	7803	contract inside
46	91	7803	contract inside
47	93	7803	contract inside
48	95	7803	contract inside
49	97	7803	contract inside
50	99	7803	contract inside
51	101	7803	contract inside
52	103	7803	contract inside
53	104	7803	reflect
54	105	7803	reflect
55	107	7803	contract inside
56	109	7803	reflect
57	111	7803	contract inside
58	112	7803	reflect
59	114	7803	expand
60	116	7803	contract inside
61	117	7803	reflect
62	119	7803	contract inside
63	120	7803	reflect
64	121	7803	reflect
65	122	7803	reflect
66	123	7803	reflect
67	125	7803	expand
68	126	7803	reflect
69	127	7803	reflect
70	129	7803	expand
71	130	7803	reflect
72	132	7803	expand
73	133	7803	reflect
74	134	7803	reflect
75	136	7803	expand
76	138	7803	expand
77	139	7803	reflect
78	140	7803	reflect
79	142	7803	expand
80	144	7803	expand
81	145	7803	reflect
82	147	7803	expand
83	148	7803	reflect
84	150	7803	expand
85	152	7803	expand
86	153	7803	reflect

87	155	7803	contract inside
88	156	7803	reflect
89	158	7803	expand
90	159	7803	reflect
91	161	7803	contract inside
92	163	7803	expand
93	164	7803	reflect
94	166	7803	reflect
95	168	7803	expand
96	170	7803	reflect
97	172	7803	reflect
98	174	7802.99	reflect
99	176	7802.99	contract inside
100	178	7802.99	contract inside
101	180	7802.99	contract inside
102	182	7802.98	reflect
103	184	7802.98	contract inside
104	186	7802.98	contract inside
105	187	7802.98	reflect
106	189	7802.98	contract inside
107	191	7802.98	contract inside
108	192	7802.98	reflect
109	194	7802.98	contract inside
110	196	7802.98	contract inside
111	198	7802.98	contract outside
112	200	7802.98	contract inside
113	202	7802.98	contract inside
114	203	7802.98	reflect
115	205	7802.98	contract inside
116	207	7802.98	contract inside
117	209	7802.98	contract outside
118	211	7802.98	contract inside
119	212	7802.98	reflect
120	213	7802.98	reflect
121	215	7802.98	contract inside
122	217	7802.98	contract inside
123	218	7802.98	reflect
124	220	7802.98	contract inside
125	222	7802.98	contract outside
126	223	7802.98	reflect
127	224	7802.98	reflect
128	226	7802.98	contract inside
129	228	7802.98	expand
130	229	7802.98	reflect
131	231	7802.98	contract inside
132	233	7802.98	expand
133	234	7802.98	reflect
134	236	7802.98	expand
135	237	7802.98	reflect
136	238	7802.98	reflect
137	240	7802.98	reflect
138	241	7802.98	reflect
139	243	7802.98	reflect
140	245	7802.98	reflect

```
141        247        7802.97        expand
142        249        7802.97        contract inside
143        250        7802.97        reflect
144        252        7802.97        expand
145        253        7802.97        reflect
146        254        7802.97        reflect
147        255        7802.97        reflect
148        257        7802.97        expand
149        259        7802.97        reflect
150        261        7802.97        contract inside
151        263        7802.97        reflect
152        265        7802.97        expand
153        266        7802.97        reflect
154        267        7802.97        reflect
155        269        7802.97        contract outside
156        270        7802.97        reflect
157        272        7802.97        contract inside
158        273        7802.97        reflect
159        275        7802.97        expand
160        276        7802.97        reflect
161        277        7802.97        reflect
162        278        7802.97        reflect
163        279        7802.97        reflect
164        280        7802.97        reflect
165        282        7802.97        reflect
166        284        7802.97        reflect
167        285        7802.97        reflect
168        286        7802.97        reflect
169        288        7802.97        contract inside
170        290        7802.97        contract inside
171        292        7802.97        expand
172        293        7802.97        reflect
173        295        7802.97        contract outside
174        297        7802.97        expand
175        298        7802.97        reflect
176        299        7802.97        reflect
177        300        7802.97        reflect
178        302        7802.96        expand
179        303        7802.96        reflect
180        304        7802.96        reflect
181        305        7802.96        reflect
182        307        7802.96        reflect
183        309        7802.96        expand
184        311        7802.96        expand
185        312        7802.96        reflect
186        313        7802.96        reflect
187        315        7802.96        expand
188        317        7802.95        expand
189        318        7802.95        reflect
190        319        7802.95        reflect
191        321        7802.94        expand
192        322        7802.94        reflect
193        324        7802.93        expand
194        326        7802.91        expand
```

195	327	7802.91	reflect
196	328	7802.91	reflect
197	329	7802.91	reflect
198	331	7802.91	reflect
199	333	7802.9	reflect
200	335	7802.87	expand
201	337	7802.8	expand
202	338	7802.8	reflect
203	339	7802.8	reflect
204	340	7802.8	reflect
205	342	7802.58	expand
206	343	7802.58	reflect
207	344	7802.58	reflect
208	346	7802.32	expand
209	347	7802.32	reflect
210	349	7802.28	reflect
211	351	7802.01	reflect
212	352	7802.01	reflect
213	354	7801.91	reflect
214	356	7801.59	expand
215	358	7801.59	contract inside
216	360	7801.59	contract inside
217	362	7801.58	reflect
218	364	7801.58	contract inside
219	366	7800.93	expand
220	368	7800.93	contract inside
221	369	7800.93	reflect
222	370	7800.93	reflect
223	371	7800.93	reflect
224	373	7800.93	contract inside
225	374	7800.93	reflect
226	376	7800.93	contract inside
227	377	7800.93	reflect
228	379	7800.57	expand
229	380	7800.57	reflect
230	381	7800.57	reflect
231	382	7800.57	reflect
232	383	7800.57	reflect
233	385	7800.57	contract inside
234	387	7800.57	contract outside
235	388	7800.57	reflect
236	389	7800.57	reflect
237	391	7800.57	contract inside
238	392	7800.57	reflect
239	394	7800.57	contract inside
240	396	7800.57	contract inside
241	398	7800.57	contract inside
242	400	7800.57	contract inside
243	402	7800.57	contract inside
244	404	7800.57	contract outside
245	406	7800.57	contract inside
246	407	7800.57	reflect
247	409	7800.57	contract inside
248	410	7800.57	reflect

249	412	7800.55	*expand*
250	414	7800.55	*reflect*
251	415	7800.55	*reflect*
252	417	7800.54	*reflect*
253	419	7800.54	*reflect*
254	420	7800.54	*reflect*
255	422	7800.52	*reflect*
256	424	7800.48	*expand*
257	425	7800.48	*reflect*
258	426	7800.48	*reflect*
259	427	7800.48	*reflect*
260	429	7800.45	*expand*
261	431	7800.41	*expand*
262	432	7800.41	*reflect*
263	433	7800.41	*reflect*
264	435	7800.38	*reflect*
265	437	7800.34	*expand*
266	439	7800.26	*expand*
267	441	7800.16	*expand*
268	442	7800.16	*reflect*
269	443	7800.16	*reflect*
270	444	7800.16	*reflect*
271	446	7800.03	*reflect*
272	448	7799.91	*expand*
273	450	7799.59	*expand*
274	451	7799.59	*reflect*
275	452	7799.59	*reflect*
276	454	7798.8	*expand*
277	455	7798.8	*reflect*
278	456	7798.8	*reflect*
279	458	7798.8	*contract inside*
280	460	7797.48	*expand*
281	462	7787.77	*expand*
282	464	7787.77	*contract inside*
283	466	7777.44	*reflect*
284	467	7777.44	*reflect*
285	469	7777.44	*contract inside*
286	471	7759.74	*reflect*
287	473	7759.74	*contract inside*
288	474	7759.74	*reflect*
289	476	7759.74	*contract inside*
290	478	7759.74	*contract inside*
291	480	7759.74	*contract inside*
292	482	7759.74	*contract inside*
293	483	7759.74	*reflect*
294	485	7759.74	*contract inside*
295	486	7759.74	*reflect*
296	487	7759.74	*reflect*
297	489	7750.17	*expand*
298	490	7750.17	*reflect*
299	491	7750.17	*reflect*
300	493	7750.17	*contract inside*
301	494	7750.17	*reflect*
302	496	7730.53	*reflect*

303	497	7730.53	reflect
304	498	7730.53	reflect
305	500	7719.81	expand
306	501	7719.81	reflect
307	503	7719.81	contract inside
308	505	7717.44	reflect
309	507	7717.44	contract inside
310	509	7703.43	reflect
311	510	7703.43	reflect
312	512	7694.57	reflect
313	513	7694.57	reflect
314	515	7694.57	contract outside
315	517	7686.35	reflect
316	518	7686.35	reflect
317	520	7686.35	contract inside
318	522	7686.35	contract inside
319	523	7686.35	reflect
320	524	7686.35	reflect
321	526	7682.91	contract inside
322	528	7682.91	contract inside
323	529	7682.91	reflect
324	530	7682.91	reflect
325	532	7682.91	contract outside
326	534	7680.89	contract outside
327	536	7680.58	reflect
328	538	7675.94	reflect
329	540	7675.94	contract inside
330	542	7675.94	contract inside
331	544	7675.94	contract inside
332	545	7675.94	reflect
333	546	7675.94	reflect
334	548	7675.94	contract inside
335	549	7675.94	reflect
336	551	7675.94	contract inside
337	552	7675.94	reflect
338	554	7675.09	reflect
339	556	7673.84	expand
340	558	7673.84	contract outside
341	560	7673.77	reflect
342	561	7673.77	reflect
343	562	7673.77	reflect
344	563	7673.77	reflect
345	565	7672.82	reflect
346	566	7672.82	reflect
347	568	7672.82	contract inside
348	569	7672.82	reflect
349	571	7672.82	contract inside
350	573	7672.82	contract inside
351	574	7672.82	reflect
352	575	7672.82	reflect
353	577	7672.64	reflect
354	579	7672.64	contract outside
355	580	7672.64	reflect
356	582	7672.63	reflect

357	584	7672.57	contract inside
358	586	7672.57	contract outside
359	588	7672.54	contract inside
360	590	7672.53	contract inside
361	592	7672.51	contract inside
362	593	7672.51	reflect
363	595	7672.49	contract inside
364	597	7672.49	contract inside
365	598	7672.49	reflect
366	600	7672.48	contract inside
367	602	7672.48	contract inside
368	604	7672.48	contract outside
369	605	7672.48	reflect
370	606	7672.48	reflect
371	608	7672.47	contract inside
372	610	7672.47	contract inside
373	612	7672.47	contract inside
374	614	7672.47	contract inside
375	616	7672.47	contract inside
376	617	7672.47	reflect
377	619	7672.46	contract inside
378	621	7672.46	reflect
379	622	7672.46	reflect
380	624	7672.46	contract inside
381	626	7672.46	contract inside
382	628	7672.46	contract inside
383	630	7672.46	contract inside
384	632	7672.46	reflect
385	634	7672.46	reflect
386	636	7672.46	contract inside
387	637	7672.46	reflect
388	639	7672.46	contract inside
389	641	7672.46	expand
390	642	7672.46	reflect
391	644	7672.46	reflect
392	645	7672.46	reflect
393	646	7672.46	reflect
394	648	7672.46	contract inside
395	650	7672.45	expand
396	651	7672.45	reflect
397	652	7672.45	reflect
398	653	7672.45	reflect
399	655	7672.45	expand
400	657	7672.45	expand
401	658	7672.45	reflect
402	660	7672.44	expand
403	662	7672.44	expand
404	664	7672.44	reflect
405	666	7672.43	expand
406	667	7672.43	reflect
407	668	7672.43	reflect
408	670	7672.42	expand
409	672	7672.42	expand
410	673	7672.42	reflect

411	675	7672.39	expand
412	677	7672.36	expand
413	678	7672.36	reflect
414	679	7672.36	reflect
415	680	7672.36	reflect
416	682	7672.34	expand
417	684	7672.26	expand
418	685	7672.26	reflect
419	686	7672.26	reflect
420	688	7672.21	expand
421	689	7672.21	reflect
422	691	7672.19	reflect
423	693	7672.04	expand
424	694	7672.04	reflect
425	695	7672.04	reflect
426	697	7671.96	expand
427	699	7671.87	expand
428	701	7671.73	expand
429	702	7671.73	reflect
430	704	7671.38	expand
431	705	7671.38	reflect
432	706	7671.38	reflect
433	708	7671.05	expand
434	709	7671.05	reflect
435	711	7670.54	expand
436	713	7669.89	expand
437	714	7669.89	reflect
438	715	7669.89	reflect
439	717	7669.69	expand
440	719	7668.39	expand
441	721	7667	expand
442	722	7667	reflect
443	723	7667	reflect
444	725	7666.47	expand
445	726	7666.47	reflect
446	728	7662	expand
447	729	7662	reflect
448	730	7662	reflect
449	731	7662	reflect
450	732	7662	reflect
451	733	7662	reflect
452	735	7658.51	expand
453	737	7655.29	expand
454	738	7655.29	reflect
455	739	7655.29	reflect
456	740	7655.29	reflect
457	742	7645.28	expand
458	743	7645.28	reflect
459	744	7645.28	reflect
460	745	7645.28	reflect
461	747	7638.06	expand
462	749	7629.25	expand
463	750	7629.25	reflect
464	751	7629.25	reflect

465	753	7620.57	expand
466	755	7602.56	expand
467	757	7583.17	expand
468	758	7583.17	reflect
469	759	7583.17	reflect
470	761	7581.9	reflect
471	763	7546.81	expand
472	765	7521.7	expand
473	766	7521.7	reflect
474	767	7521.7	reflect
475	768	7521.7	reflect
476	770	7521.7	contract inside
477	772	7487.1	expand
478	773	7487.1	reflect
479	774	7487.1	reflect
480	776	7466.07	expand
481	777	7466.07	reflect
482	779	7457.53	expand
483	780	7457.53	reflect
484	782	7457.53	contract inside
485	783	7457.53	reflect
486	784	7457.53	reflect
487	786	7451.72	reflect
488	788	7451.72	contract inside
489	790	7451.72	contract inside
490	792	7451.72	contract outside
491	793	7451.72	reflect
492	795	7451.72	contract inside
493	797	7451.72	contract inside
494	799	7445.07	expand
495	801	7445.07	contract inside
496	802	7445.07	reflect
497	803	7445.07	reflect
498	804	7445.07	reflect
499	806	7438.49	expand
500	807	7438.49	reflect
501	809	7430.1	expand
502	810	7430.1	reflect
503	812	7427.64	expand
504	814	7415.07	expand
505	816	7401.39	expand
506	817	7401.39	reflect
507	818	7401.39	reflect
508	819	7401.39	reflect
509	820	7401.39	reflect
510	821	7401.39	reflect
511	823	7395.56	reflect
512	824	7395.56	reflect
513	825	7395.56	reflect
514	826	7395.56	reflect
515	828	7387.58	expand
516	829	7387.58	reflect
517	830	7387.58	reflect
518	831	7387.58	reflect

```
519        833        7376.2        reflect
520        835        7376.2        contract inside
521        836        7376.2        reflect
522        838        7376.2        contract inside
523        840        7374.66       reflect
524        841        7374.66       reflect
525        842        7374.66       reflect
526        843        7374.66       reflect
527        845        7374.66       contract inside
528        847        7374.66       contract inside
529        848        7374.66       reflect
530        850        7374.66       contract inside
531        852        7374.12       contract inside
532        853        7374.12       reflect
533        854        7374.12       reflect
534        856        7371.29       expand
535        857        7371.29       reflect
536        859        7371.29       contract inside
537        860        7371.29       reflect
538        861        7371.29       reflect
539        862        7371.29       reflect
540        864        7371.29       contract inside
541        865        7371.29       reflect
542        867        7369.13       expand
543        869        7369.13       contract inside
544        870        7369.13       reflect
545        871        7369.13       reflect
546        872        7369.13       reflect
547        873        7369.13       reflect
548        875        7369.06       reflect
549        876        7369.06       reflect
550        878        7367.9        reflect
551        879        7367.9        reflect
552        880        7367.9        reflect
553        882        7367.01       reflect
554        883        7367.01       reflect
555        884        7367.01       reflect
556        886        7367.01       contract inside
557        888        7367.01       contract inside
558        889        7367.01       reflect
559        891        7366.08       expand
560        893        7366.08       contract inside
561        894        7366.08       reflect
562        896        7365.85       reflect
563        897        7365.85       reflect
564        898        7365.85       reflect
565        899        7365.85       reflect
566        901        7365.85       contract inside
567        903        7365.58       reflect
568        905        7365.58       contract outside
569        906        7365.58       reflect
570        907        7365.58       reflect
571        909        7365.58       contract inside
572        911        7365.5        contract inside
```

573	913	7365.5	contract inside
574	915	7365.5	contract inside
575	917	7365.5	contract inside
576	919	7365.46	contract inside
577	920	7365.46	reflect
578	922	7365.46	contract inside
579	924	7365.44	reflect
580	925	7365.44	reflect
581	927	7365.43	contract inside
582	929	7365.43	contract inside
583	931	7365.42	contract inside
584	933	7365.42	contract inside
585	935	7365.42	contract inside
586	937	7365.41	contract outside
587	939	7365.41	contract inside
588	941	7365.41	contract inside
589	943	7365.41	contract inside
590	944	7365.41	reflect
591	946	7365.41	contract inside
592	948	7365.41	contract inside
593	950	7365.41	contract inside
594	952	7365.41	contract inside
595	954	7365.41	contract inside
596	956	7365.41	contract outside
597	958	7365.41	contract inside
598	960	7365.41	contract inside
599	961	7365.41	reflect
600	963	7365.41	contract inside
601	965	7365.41	contract inside
602	967	7365.41	contract inside
603	968	7365.41	reflect
604	970	7365.41	contract inside
605	972	7365.41	contract inside
606	974	7365.41	contract inside
607	976	7365.41	contract inside
608	978	7365.41	contract inside
609	980	7365.41	contract inside
610	982	7365.41	contract inside
611	984	7365.41	contract inside
612	986	7365.41	contract outside
613	988	7365.41	contract inside
614	990	7365.41	contract inside
615	992	7365.41	contract outside
616	994	7365.41	contract inside
617	996	7365.41	contract inside
618	997	7365.41	reflect
619	999	7365.41	contract inside
620	1001	7365.41	contract inside
621	1003	7365.41	contract inside
622	1005	7365.41	contract inside
623	1006	7365.41	reflect
624	1008	7365.41	contract inside
625	1010	7365.41	contract inside
626	1012	7365.41	contract outside

```
627        1014          7365.41        contract outside
628        1016          7365.41        contract inside
629        1017          7365.41        reflect
630        1019          7365.41        contract inside
631        1021          7365.41        contract inside
632        1023          7365.41        contract inside
633        1025          7365.41        contract inside
634        1027          7365.41        contract inside
635        1029          7365.41        contract inside
636        1030          7365.41        reflect
637        1032          7365.41        contract inside
638        1034          7365.41        contract inside


Optimization terminated:
 the current x satisfies the termination criteria using OPTIONS.TolX
 of 1.000000e-04
 and F(X) satisfies the convergence criteria using OPTIONS.TolFun of
 1.000000e-04


Iteration    Func-count       min f(x)          Procedure
    0             1          4.97197e+77
    1             7          4.97197e+77       initial simplex
    2             9          2.72814e+73       expand
    3            10          2.72814e+73       reflect
    4            11          2.72814e+73       reflect
    5            12          2.72814e+73       reflect
    6            13          2.72814e+73       reflect
    7            15          1.30523e+70       expand
    8            16          1.30523e+70       reflect
    9            18          1.66696e+67       expand
   10            19          1.66696e+67       reflect
   11            21          3.48034e+61       expand
   12            22          3.48034e+61       reflect
   13            24          8.33104e+52       expand
   14            25          8.33104e+52       reflect
   15            26          8.33104e+52       reflect
   16            28          1.59929e+42       expand
   17            29          1.59929e+42       reflect
   18            31           1.8179e+30       expand
   19            32           1.8179e+30       reflect
   20            34          1.28474e+20       expand
   21            35          1.28474e+20       reflect
   22            37          1.17414e+10       expand
   23            38          1.17414e+10       reflect
   24            40             61826.7        expand
   25            41             61826.7        reflect
   26            42             61826.7        reflect
   27            43             61826.7        reflect
   28            44             61826.7        reflect
   29            45             61826.7        reflect
   30            47             61826.7        contract outside
   31            49             61826.7        contract inside
   32            50             61826.7        reflect
```

33	52	61826.7	*contract inside*
34	54	61826.7	*contract inside*
35	56	61826.7	*contract inside*
36	58	61826.7	*contract inside*
37	60	61826.7	*contract inside*
38	62	55042.6	*contract inside*
39	64	50340.5	*reflect*
40	66	50340.5	*contract inside*
41	67	50340.5	*reflect*
42	69	50340.5	*contract inside*
43	71	50340.5	*contract inside*
44	72	50340.5	*reflect*
45	74	50340.5	*contract inside*
46	76	50340.5	*contract inside*
47	78	50340.5	*contract inside*
48	80	50340.5	*contract inside*
49	81	50340.5	*reflect*
50	83	50239.4	*contract inside*
51	85	50239.4	*contract inside*
52	87	50239.4	*contract inside*
53	89	50239.4	*contract inside*
54	91	50075.8	*contract inside*
55	93	50075.8	*contract inside*
56	95	50075.8	*contract inside*
57	96	50075.8	*reflect*
58	98	50075.8	*contract inside*
59	100	50075.8	*contract outside*
60	102	50075.8	*contract inside*
61	104	50075.8	*contract outside*
62	106	50075.8	*contract inside*
63	108	49761.4	*expand*
64	110	49761.4	*contract inside*
65	111	49761.4	*reflect*
66	112	49761.4	*reflect*
67	114	49563	*expand*
68	116	49326	*expand*
69	118	49135.7	*expand*
70	120	48357.1	*expand*
71	121	48357.1	*reflect*
72	123	47459.5	*expand*
73	125	46209.9	*expand*
74	126	46209.9	*reflect*
75	128	44662.3	*expand*
76	129	44662.3	*reflect*
77	131	42081.8	*expand*
78	132	42081.8	*reflect*
79	133	42081.8	*reflect*
80	135	37538.5	*expand*
81	136	37538.5	*reflect*
82	138	33365.8	*expand*
83	139	33365.8	*reflect*
84	140	33365.8	*reflect*
85	142	25843.6	*expand*
86	143	25843.6	*reflect*

87	144	25843.6	reflect
88	145	25843.6	reflect
89	147	25843.6	contract inside
90	149	25843.6	contract inside
91	151	25743.9	contract inside
92	153	25743.9	contract inside
93	155	25743.9	contract outside
94	157	25743.9	contract inside
95	159	25743.9	contract inside
96	161	25743.9	contract inside
97	163	25743.9	contract inside
98	164	25743.9	reflect
99	166	25743.9	contract inside
100	168	25742.5	contract inside
101	170	25742.5	contract inside
102	172	25742.5	contract outside
103	173	25742.5	reflect
104	175	25725.2	contract inside
105	176	25725.2	reflect
106	178	25547.4	expand
107	180	25547.4	contract inside
108	181	25547.4	reflect
109	182	25547.4	reflect
110	183	25547.4	reflect
111	185	25449.6	expand
112	187	25228.7	expand
113	188	25228.7	reflect
114	189	25228.7	reflect
115	191	25012.6	expand
116	192	25012.6	reflect
117	193	25012.6	reflect
118	195	24736.4	expand
119	196	24736.4	reflect
120	198	24308.6	expand
121	199	24308.6	reflect
122	201	23631.4	expand
123	202	23631.4	reflect
124	203	23631.4	reflect
125	205	22395.3	expand
126	206	22395.3	reflect
127	207	22395.3	reflect
128	209	21013.7	expand
129	210	21013.7	reflect
130	211	21013.7	reflect
131	213	18791.2	expand
132	214	18791.2	reflect
133	215	18791.2	reflect
134	217	17577.5	expand
135	219	15153.3	expand
136	220	15153.3	reflect
137	221	15153.3	reflect
138	222	15153.3	reflect
139	223	15153.3	reflect
140	224	15153.3	reflect

141	225	15153.3	reflect
142	227	13867	reflect
143	229	13867	contract inside
144	230	13867	reflect
145	232	13867	contract inside
146	234	11148.4	expand
147	236	11148.4	contract outside
148	237	11148.4	reflect
149	238	11148.4	reflect
150	239	11148.4	reflect
151	240	11148.4	reflect
152	242	11148.4	contract inside
153	244	10507.6	expand
154	245	10507.6	reflect
155	247	10160.2	reflect
156	249	9084.64	expand
157	250	9084.64	reflect
158	252	9084.64	contract inside
159	253	9084.64	reflect
160	254	9084.64	reflect
161	255	9084.64	reflect
162	256	9084.64	reflect
163	258	9084.64	contract inside
164	259	9084.64	reflect
165	261	9084.64	contract inside
166	263	9065.55	reflect
167	264	9065.55	reflect
168	266	8984.05	reflect
169	268	8874.31	reflect
170	270	8711.96	reflect
171	272	8711.96	contract inside
172	273	8711.96	reflect
173	275	8711.96	contract inside
174	277	8711.96	contract outside
175	278	8711.96	reflect
176	279	8711.96	reflect
177	281	8711.96	contract inside
178	283	8711.96	contract inside
179	284	8711.96	reflect
180	285	8711.96	reflect
181	286	8711.96	reflect
182	288	8682.15	contract inside
183	290	8682.15	contract inside
184	292	8682.15	contract outside
185	294	8666.14	reflect
186	296	8666.14	contract outside
187	298	8666.14	contract inside
188	300	8666.14	contract outside
189	301	8666.14	reflect
190	303	8658.49	reflect
191	305	8658.49	contract outside
192	307	8641.22	reflect
193	309	8641.22	contract inside
194	310	8641.22	reflect

195	*311*	*8641.22*	*reflect*
196	*313*	*8641.22*	*contract outside*
197	*315*	*8641.22*	*contract inside*
198	*317*	*8633.78*	*reflect*
199	*318*	*8633.78*	*reflect*
200	*320*	*8633.78*	*contract inside*
201	*322*	*8633.63*	*reflect*
202	*324*	*8630.44*	*reflect*
203	*326*	*8630.44*	*contract inside*
204	*328*	*8617.02*	*expand*
205	*329*	*8617.02*	*reflect*
206	*331*	*8608.11*	*expand*
207	*333*	*8603.1*	*expand*
208	*334*	*8603.1*	*reflect*
209	*336*	*8596.47*	*reflect*
210	*338*	*8560.72*	*expand*
211	*339*	*8560.72*	*reflect*
212	*340*	*8560.72*	*reflect*
213	*341*	*8560.72*	*reflect*
214	*342*	*8560.72*	*reflect*
215	*344*	*8522.64*	*expand*
216	*345*	*8522.64*	*reflect*
217	*346*	*8522.64*	*reflect*
218	*348*	*8487.17*	*expand*
219	*349*	*8487.17*	*reflect*
220	*351*	*8458.29*	*expand*
221	*353*	*8412.57*	*expand*
222	*354*	*8412.57*	*reflect*
223	*355*	*8412.57*	*reflect*
224	*356*	*8412.57*	*reflect*
225	*357*	*8412.57*	*reflect*
226	*358*	*8412.57*	*reflect*
227	*359*	*8412.57*	*reflect*
228	*361*	*8376.8*	*reflect*
229	*362*	*8376.8*	*reflect*
230	*364*	*8284.78*	*expand*
231	*366*	*8284.78*	*contract outside*
232	*367*	*8284.78*	*reflect*
233	*368*	*8284.78*	*reflect*
234	*369*	*8284.78*	*reflect*
235	*370*	*8284.78*	*reflect*
236	*371*	*8284.78*	*reflect*
237	*373*	*8240.57*	*expand*
238	*375*	*8187.71*	*expand*
239	*377*	*8132.3*	*expand*
240	*378*	*8132.3*	*reflect*
241	*379*	*8132.3*	*reflect*
242	*381*	*8050.89*	*expand*
243	*382*	*8050.89*	*reflect*
244	*384*	*7892.6*	*expand*
245	*385*	*7892.6*	*reflect*
246	*386*	*7892.6*	*reflect*
247	*388*	*7892.6*	*contract inside*
248	*389*	*7892.6*	*reflect*

249	390	7892.6	reflect
250	392	7717.85	expand
251	393	7717.85	reflect
252	394	7717.85	reflect
253	396	7667.25	expand
254	397	7667.25	reflect
255	398	7667.25	reflect
256	399	7667.25	reflect
257	400	7667.25	reflect
258	402	7584.49	reflect
259	404	7584.49	contract inside
260	405	7584.49	reflect
261	407	7584.49	contract inside
262	409	7584.49	contract inside
263	411	7568.28	reflect
264	413	7533.57	reflect
265	415	7507.46	reflect
266	416	7507.46	reflect
267	417	7507.46	reflect
268	418	7507.46	reflect
269	420	7450.05	expand
270	421	7450.05	reflect
271	422	7450.05	reflect
272	423	7450.05	reflect
273	424	7450.05	reflect
274	425	7450.05	reflect
275	427	7450.05	contract inside
276	428	7450.05	reflect
277	430	7450.05	contract inside
278	432	7445.1	contract inside
279	434	7445.1	contract inside
280	436	7443.3	contract inside
281	438	7443.3	contract inside
282	440	7443.16	contract inside
283	442	7441.87	contract inside
284	443	7441.87	reflect
285	444	7441.87	reflect
286	446	7439.75	contract inside
287	448	7439.75	contract inside
288	450	7438.9	contract inside
289	452	7438.9	contract inside
290	453	7438.9	reflect
291	455	7438.84	reflect
292	456	7438.84	reflect
293	458	7437.88	contract inside
294	460	7437.88	contract inside
295	462	7437.88	contract inside
296	463	7437.88	reflect
297	465	7437.88	contract inside
298	467	7436.66	reflect
299	469	7436.66	contract inside
300	471	7436.66	contract inside
301	472	7436.66	reflect
302	473	7436.66	reflect

303	475	7436.1	reflect
304	477	7436.09	reflect
305	479	7435.93	reflect
306	480	7435.93	reflect
307	482	7435.61	reflect
308	484	7434.35	expand
309	485	7434.35	reflect
310	487	7433.28	expand
311	488	7433.28	reflect
312	489	7433.28	reflect
313	491	7431.36	expand
314	492	7431.36	reflect
315	493	7431.36	reflect
316	494	7431.36	reflect
317	496	7430.35	expand
318	497	7430.35	reflect
319	499	7430.32	reflect
320	501	7429.54	reflect
321	503	7425.19	expand
322	504	7425.19	reflect
323	505	7425.19	reflect
324	507	7422.85	expand
325	508	7422.85	reflect
326	509	7422.85	reflect
327	510	7422.85	reflect
328	512	7417.96	expand
329	514	7410.44	expand
330	515	7410.44	reflect
331	516	7410.44	reflect
332	518	7406.28	expand
333	520	7402.41	expand
334	522	7393.6	expand
335	524	7381.7	expand
336	525	7381.7	reflect
337	526	7381.7	reflect
338	528	7378.38	expand
339	529	7378.38	reflect
340	531	7371.24	reflect
341	533	7362.22	expand
342	535	7333.72	expand
343	536	7333.72	reflect
344	538	7333.72	contract outside
345	539	7333.72	reflect
346	540	7333.72	reflect
347	541	7333.72	reflect
348	543	7327.56	expand
349	545	7314.69	expand
350	547	7284.68	expand
351	549	7247.94	expand
352	550	7247.94	reflect
353	552	7206.66	expand
354	553	7206.66	reflect
355	555	7110.13	expand
356	556	7110.13	reflect

357	557	7110.13	reflect
358	559	7049.54	expand
359	561	6977.93	expand
360	563	6812.73	expand
361	564	6812.73	reflect
362	565	6812.73	reflect
363	567	6612.6	expand
364	568	6612.6	reflect
365	570	6360.6	expand
366	571	6360.6	reflect
367	572	6360.6	reflect
368	574	6057.45	expand
369	575	6057.45	reflect
370	577	5866.88	expand
371	578	5866.88	reflect
372	580	5314	expand
373	581	5314	reflect
374	582	5314	reflect
375	583	5314	reflect
376	585	4625.42	expand
377	587	4625.42	contract inside
378	588	4625.42	reflect
379	589	4625.42	reflect
380	590	4625.42	reflect
381	592	3987.67	expand
382	593	3987.67	reflect
383	595	3146.22	expand
384	596	3146.22	reflect
385	597	3146.22	reflect
386	599	2999.86	reflect
387	600	2999.86	reflect
388	602	2999.86	contract inside
389	603	2999.86	reflect
390	605	2725.9	expand
391	607	2725.9	contract inside
392	608	2725.9	reflect
393	610	2694.51	reflect
394	612	2693.2	reflect
395	613	2693.2	reflect
396	615	2486.95	reflect
397	617	2274.46	reflect
398	619	2257.4	reflect
399	621	2257.4	contract inside
400	622	2257.4	reflect
401	623	2257.4	reflect
402	625	2257.4	contract outside
403	626	2257.4	reflect
404	627	2257.4	reflect
405	629	2191.11	contract inside
406	631	2191.11	contract inside
407	633	2191.11	contract inside
408	634	2191.11	reflect
409	635	2191.11	reflect
410	637	2161.6	contract inside

411	639	2147.49	reflect
412	640	2147.49	reflect
413	642	2147.49	contract inside
414	644	2147.49	contract inside
415	646	2147.49	contract inside
416	648	2147.49	contract inside
417	650	2147.49	contract inside
418	651	2147.49	reflect
419	653	2147.49	contract inside
420	655	2147.49	contract inside
421	657	2147.49	contract inside
422	658	2147.49	reflect
423	659	2147.49	reflect
424	661	2147.49	contract inside
425	663	2143.39	reflect
426	665	2143.39	contract inside
427	667	2143.39	contract inside
428	668	2143.39	reflect
429	669	2143.39	reflect
430	670	2143.39	reflect
431	672	2143.39	contract inside
432	674	2141.19	reflect
433	676	2140.82	reflect
434	677	2140.82	reflect
435	679	2140.82	contract outside
436	681	2136.71	expand
437	682	2136.71	reflect
438	683	2136.71	reflect
439	684	2136.71	reflect
440	685	2136.71	reflect
441	686	2136.71	reflect
442	688	2135.18	reflect
443	689	2135.18	reflect
444	691	2134.11	reflect
445	692	2134.11	reflect
446	694	2134.11	contract inside
447	696	2134.11	contract inside
448	698	2134.11	contract inside
449	699	2134.11	reflect
450	701	2133.45	reflect
451	703	2133.39	reflect
452	705	2133.39	contract inside
453	706	2133.39	reflect
454	707	2133.39	reflect
455	708	2133.39	reflect
456	710	2133.39	contract outside
457	712	2133.39	contract inside
458	713	2133.39	reflect
459	714	2133.39	reflect
460	716	2133.34	contract inside
461	718	2133.28	contract inside
462	719	2133.28	reflect
463	721	2133.23	contract inside
464	722	2133.23	reflect

465	724	2133.21	contract inside
466	726	2133.21	contract inside
467	728	2133.16	contract inside
468	730	2133.16	contract inside
469	731	2133.16	reflect
470	733	2133.16	contract inside
471	735	2133.16	contract inside
472	737	2133.16	contract inside
473	739	2133.16	contract inside
474	741	2133.16	contract inside
475	743	2133.16	contract inside
476	744	2133.16	reflect
477	745	2133.16	reflect
478	746	2133.16	reflect
479	748	2133.15	reflect
480	750	2133.13	contract inside
481	751	2133.13	reflect
482	753	2133.13	contract inside
483	754	2133.13	reflect
484	756	2133.11	expand
485	757	2133.11	reflect
486	759	2133.11	contract outside
487	760	2133.11	reflect
488	761	2133.11	reflect
489	762	2133.11	reflect
490	763	2133.11	reflect
491	765	2133.11	reflect
492	766	2133.11	reflect
493	768	2133.11	reflect
494	770	2133.08	expand
495	771	2133.08	reflect
496	772	2133.08	reflect
497	773	2133.08	reflect
498	775	2133.08	contract inside
499	777	2133.08	reflect
500	778	2133.08	reflect
501	779	2133.08	reflect
502	780	2133.08	reflect
503	782	2133.07	reflect
504	784	2133.07	contract outside
505	785	2133.07	reflect
506	787	2133.07	contract inside
507	789	2133.07	contract inside
508	791	2133.07	contract inside
509	792	2133.07	reflect
510	794	2133.07	contract inside
511	796	2133.07	contract inside
512	797	2133.07	reflect
513	799	2133.07	contract inside
514	800	2133.07	reflect
515	801	2133.07	reflect
516	803	2133.07	reflect
517	805	2133.07	contract inside
518	807	2133.07	contract inside

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519        809        2133.07        contract inside
520        811        2133.07        contract outside
521        813        2133.07        contract inside
522        815        2133.07        contract outside
523        816        2133.07        reflect
524        818        2133.07        contract inside
525        820        2133.07        contract inside
526        822        2133.07        contract inside
527        824        2133.07        contract outside
528        826        2133.07        contract inside
529        828        2133.07        contract outside
530        830        2133.07        reflect
531        832        2133.07        contract inside
532        833        2133.07        reflect
533        835        2133.07        contract inside
534        837        2133.07        contract inside
535        838        2133.07        reflect
536        840        2133.07        contract inside
537        842        2133.07        contract outside
538        844        2133.07        contract inside
539        846        2133.07        contract inside
540        848        2133.07        contract outside
541        849        2133.07        reflect
542        851        2133.07        reflect
543        853        2133.07        contract inside
544        855        2133.07        contract inside
545        856        2133.07        reflect
546        858        2133.07        contract inside
547        860        2133.07        contract inside
548        862        2133.07        contract inside
549        864        2133.07        contract inside
550        866        2133.07        contract inside
551        868        2133.07        reflect
552        870        2133.07        contract inside
553        871        2133.07        reflect
554        872        2133.07        reflect
555        874        2133.07        contract inside
556        875        2133.07        reflect
557        877        2133.07        contract inside
558        879        2133.07        contract inside
```

Optimization terminated:
the current x satisfies the termination criteria using OPTIONS.TolX
of 1.000000e-04
and F(X) satisfies the convergence criteria using OPTIONS.TolFun of
1.000000e-04

Iteration	Func-count	f(x)	Step-size	First-order optimality
0	7	4.97197e+77		2.83e+79
1	14	3.81784e+50	3.52855e-80	2.18e+52

Local minimum found.

Optimization completed because the size of the gradient is less than the value of the optimality tolerance.

			Norm of	First-order
Iteration	*Func-count*	*f(x)*	*step*	*optimality*
0	7	8.35317e+154		4.76e+156
1	14	1.13049e+154	10	6.44e+155
2	21	1.52994e+153	20	8.72e+154
3	28	2.0706e+152	40	1.18e+154
4	35	2.80225e+151	1.00188	1.6e+153
5	42	3.79244e+150	1.00081	2.16e+152
6	49	5.13251e+149	0.99823	2.93e+151
7	56	6.9461e+148	1.00258	3.96e+150
8	63	9.40053e+147	1.00285	5.36e+149
9	70	1.27222e+147	0.999188	7.25e+148
10	77	1.72177e+146	1.00362	9.81e+147
11	84	2.33016e+145	0.992304	1.33e+147
12	91	3.15353e+144	0.998777	1.8e+146
13	98	4.26784e+143	1.00932	2.43e+145
14	105	5.7759e+142	0.995821	3.29e+144
15	112	7.81683e+141	0.996787	4.46e+143
16	119	1.05789e+141	1.00322	6.03e+142
17	126	1.4317e+140	1.00172	8.16e+141
18	133	1.9376e+139	1.0063	1.1e+141
19	140	2.62226e+138	1.00307	1.49e+140
20	147	3.54884e+137	1.00354	2.02e+139
21	154	4.80284e+136	0.998102	2.74e+138
22	161	6.49993e+135	1.00302	3.7e+137
23	168	8.7967e+134	0.997056	5.01e+136
24	175	1.1905e+134	0.996016	6.79e+135
25	182	1.61117e+133	1.00341	9.18e+134
26	189	2.18049e+132	0.999148	1.24e+134
27	196	2.95097e+131	0.995237	1.68e+133
28	203	3.9937e+130	0.996751	2.28e+132
29	210	5.40489e+129	1.00119	3.08e+131
30	217	7.31472e+128	0.999251	4.17e+130
31	224	9.89939e+127	0.997967	5.64e+129
32	231	1.33974e+127	0.993573	7.64e+128
33	238	1.81314e+126	0.997864	1.03e+128
34	245	2.45381e+125	0.997354	1.4e+127
35	252	3.32087e+124	0.993356	1.89e+126
36	259	4.49431e+123	0.999631	2.56e+125
37	266	6.0824e+122	0.99083	3.47e+124
38	273	8.23163e+121	0.999842	4.69e+123
39	280	1.11403e+121	1.00204	6.35e+122
40	287	1.50768e+120	1.00207	8.59e+121
41	294	2.04042e+119	0.997824	1.16e+121
42	301	2.76141e+118	0.997473	1.57e+120
43	308	3.73716e+117	1.00212	2.13e+119
44	315	5.05769e+116	0.993645	2.88e+118
45	322	6.84484e+115	0.996749	3.9e+117
46	329	9.26349e+114	0.993505	5.28e+116
47	336	1.25368e+114	0.996454	7.15e+115

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48        343     1.69667e+113       1.00522      9.67e+114
49        350     2.29619e+112      0.999602      1.31e+114
50        357     3.10755e+111       0.99327      1.77e+113
51        364     4.20561e+110      0.997556        2.4e+112
52        371     5.69168e+109      0.997945      3.24e+111
53        378     7.70284e+108       1.00151      4.39e+110
54        385     1.04247e+108       1.00123      5.94e+109
55        392     1.41082e+107       1.00356      8.04e+108
56        399     1.90934e+106      0.995407      1.09e+108
57        406     2.58401e+105      0.999602      1.47e+107
58        413     3.49708e+104       1.00459      1.99e+106
59        420     4.73278e+103      0.996889        2.7e+105
60        427     6.40512e+102       0.99868      3.65e+104
61        434     8.66839e+101      0.992968      4.94e+103
62        441     1.17314e+101      0.992674      6.69e+102
63        448     1.58767e+100      0.994041      9.05e+101
64        455      2.14868e+99      0.998419      1.22e+101
65        462      2.90792e+98      0.999252      1.66e+100
66        469      3.93543e+97      0.991268        2.24e+99
67        476      5.32603e+96      0.991425        3.04e+98
68        483      7.20799e+95       1.00165        4.11e+97
69        490      9.75495e+94      0.999359        5.56e+96
70        497      1.32019e+94             1        7.53e+95
71        504      1.78668e+93      0.999692        1.02e+95
72        511      2.41801e+92      0.997338        1.38e+94
73        518      3.27241e+91      0.995874        1.87e+93
74        525      4.42873e+90      0.995525        2.52e+92
75        532      5.99363e+89      0.994175        3.42e+91
76        539      8.11149e+88      0.989596        4.62e+90
77        546      1.09777e+88      0.997616        6.26e+89
78        553      1.48567e+87      0.989489        8.47e+88
79        560      2.01063e+86      0.997252        1.15e+88
80        567       2.7211e+85      0.998538        1.55e+87
81        574        3.6826e+84     0.998403         2.1e+86
82        581      4.98385e+83      0.996936        2.84e+85
83        588      6.74491e+82       0.99958        3.84e+84
84        595      9.12823e+81      0.995565         5.2e+83
85        602      1.23537e+81       0.99513        7.04e+82
```

Solver stopped prematurely.

lsqnonlin stopped because it exceeded the function evaluation limit,
options.MaxFunctionEvaluations = 6.000000e+02.

```
Iteration   Func-count     min f(x)          Procedure
    0            1      8.35317e+154
    1            7      8.35317e+154          initial simplex
    2            9      2.56174e+146          expand
    3           10      2.56174e+146          reflect
    4           11      2.56174e+146          reflect
    5           12      2.56174e+146          reflect
    6           13      2.56174e+146          reflect
    7           15      5.98286e+139          expand
```

```
    8              16        5.98286e+139        reflect
    9              18        9.69277e+133        expand
   10              19        9.69277e+133        reflect
   11              21         4.2009e+122        expand
   12              22         4.2009e+122        reflect
   13              24        2.52737e+105        expand
   14              25        2.52737e+105        reflect
   15              26        2.52737e+105        reflect
   16              28         9.10523e+83        expand
   17              29         9.10523e+83        reflect
   18              31          5.1156e+59        expand
   19              32          5.1156e+59        reflect
   20              34         1.30857e+40        expand
   21              35         1.30857e+40        reflect
   22              37          1.3786e+20        expand
   23              38          1.3786e+20        reflect
   24              40             7803.89        expand
   25              41             7803.89        reflect
   26              43                7803        expand
   27              44                7803        reflect
   28              45                7803        reflect
   29              46                7803        reflect
   30              47                7803        reflect
   31              48                7803        reflect
   32              50                7803        contract outside
   33              58                7803        shrink
   34              66                7803        shrink
   35              74                7803        shrink
   36              82                7803        shrink
   37              90                7803        shrink
   38              98                7803        shrink
   39             106                7803        shrink
   40             114                7803        shrink
   41             122                7803        shrink
   42             130                7803        shrink
   43             138                7803        shrink
   44             146                7803        shrink
   45             154                7803        shrink
   46             162                7803        shrink
   47             170                7803        shrink

Optimization terminated:
 the current x satisfies the termination criteria using OPTIONS.TolX
 of 1.000000e-04
 and F(X) satisfies the convergence criteria using OPTIONS.TolFun of
 1.000000e-04


BHAT1 =

    2.5338    2.5339    2.5340    2.5924   -5.1753
   -0.0323   -0.0323   -0.0323   -0.0333    0.0373
    0.1157    0.1157    0.1157    0.1162    0.0873
   -0.3540   -0.3540   -0.3540   -0.3572    0.1918
```

```
     0.0798     0.0798     0.0798     0.0783     0.3028
    -0.4094    -0.4094    -0.4094    -0.4131     0.2650


   BHAT2 =

     2.5339     2.5358     0.3823     0.9825     1.9825
    -0.0323    -0.0323    -0.6000          0     1.0000
     0.1157     0.1157     0.1341     0.7368     1.7368
    -0.3540    -0.3541     0.3265     0.9196     1.9155
     0.0798     0.0798     0.3023     0.8973     1.8952
    -0.4094    -0.4095     0.3217     0.9142     1.9125


   BHAT3 =

     2.5124     2.5123     2.5121   -43.7066   -49.9256
    -0.0384    -0.0384    -0.0384     0.6967     1.9510
     0.1141     0.1141     0.1141    -0.4721    -0.0138
    -0.2798    -0.2797    -0.2797     1.0078     1.9958
     0.0677     0.0677     0.0677     0.8033     1.9949
    -0.3698    -0.3698    -0.3699     1.0436     1.9958


   BHAT4 =

    -1.3450     2.5125     2.9274     3.0081     2.3735
    -0.0249    -0.0384    -0.0448    -0.5959    -5.8206
     0.3012     0.1141     0.1138     0.7868     3.0009
    -0.1578    -0.2796    -0.3377     3.0735     3.2772
     0.0721     0.0677     0.0427     0.1022     1.2728
    -0.3121    -0.3698    -0.3421    -3.4007     4.2675
```
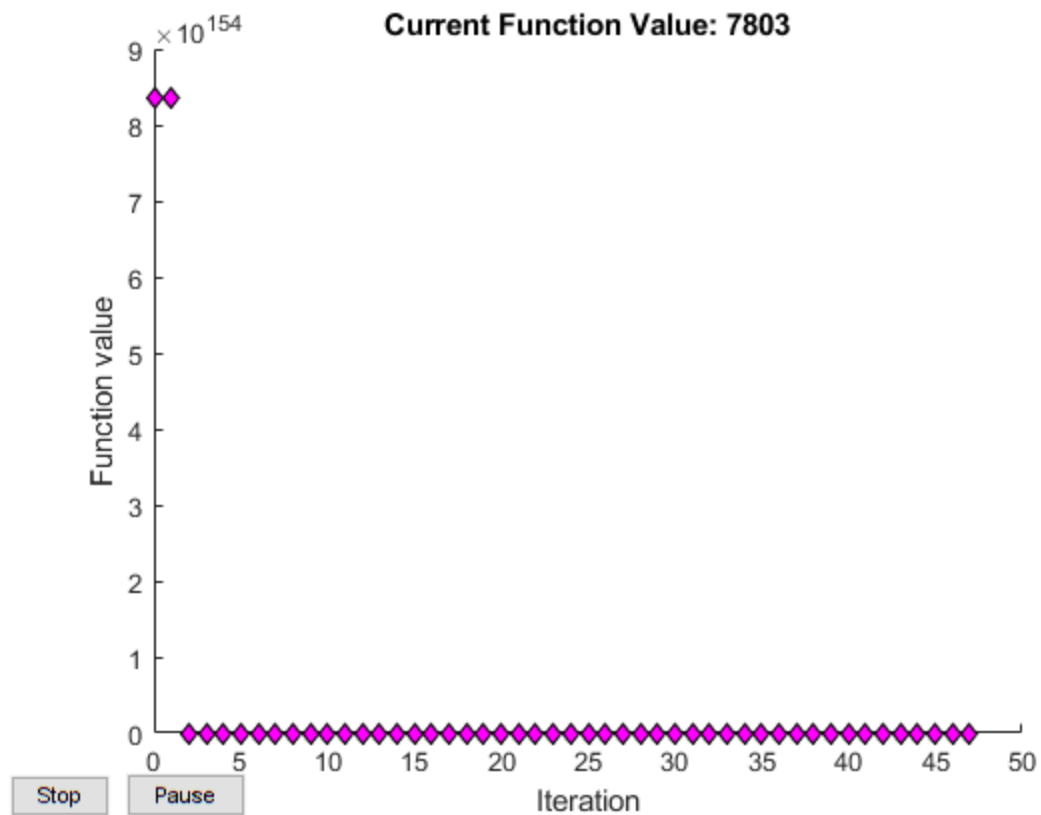
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