

By: Mohammad Abubakar Atiq, To Sir Rehan Ashrad,  
BSIE, F2022031002

Example 10: A Bombing Mission, page 68, Chapter 02

Consider a bomber attempting to destroy an ammunition depot. (This bomber has conventional rather than laser-guided weapons). If a bomb falls anywhere inside the target, a hit is scored; otherwise, the bomb is a miss. (Note that when a bomb appears visually to have touched a boundary line, it may or may not have hit the target; the model determines mathematically whether a hit has occurred, using the (X,Y) coordinates and the equations of the piecewise-linear boundary of the depot.)

The bomber flies in the horizontal direction and carries 10 bombs. The aiming point is (0,0). The actual point of impact is assumed to be normally distributed around the aiming point with a standard deviation of 400 meters in the direction of flight and 200 meters in the perpendicular direction. The problem is to simulate the operation and estimate the number of bombs on target.

Recall that the standardized normal variate Z, having mean  $\mu = 0$ , and standard deviation  $\sigma = 1$ , is distributed as

$$Z = \frac{X - \mu}{\sigma}$$

Where X is a normal random variable, Then, with mean zero and standard deviations given by

$\sigma_X = 400$  and  $\sigma_Y = 200$ , we have

$$Z_X = \frac{X}{400}, Z_Y = \frac{Y}{200}$$

Where (X,Y) are the simulated coordinates where the bomb hits.

Number of Hits	Number of Miss	No. of Trials	Probability of Hits	Probability of Misses	PDF
379	191	570	0.665	0.335	1

$\sigma_X$	=	400	<b>X range: <math>X_{low} \leq X \leq X_{high}</math>, Y range: <math>Y_{low} \leq Y \leq Y_{high}</math>,</b>
$\sigma_Y$	=	200	

**$Z_X$  and  $Z_Y$   
Random Normal Number,**

$X_{low}$	=	-1300
$X_{high}$	=	1300
$Y_{low}$	=	-200
$Y_{high}$	=	200

Bomb	$Z_X$	$\sigma_X$	$X$	$Z_Y$	$\sigma_Y$	$Y$	Hit Or Miss?
1	1.131	400	452.306	-0.863	200	-172.537	Hit
2	1.375	400	549.918	-0.146	200	-29.102	Hit
3	-0.849	400	-339.523	-1.785	200	-357.079	Miss
4	0.098	400	39.075	0.175	200	34.911	Hit
5	2.079	400	831.574	0.684	200	136.726	Hit
6	0.935	400	374.037	0.590	200	117.988	Hit
7	-0.239	400	-95.767	0.798	200	159.650	Hit
8	-0.126	400	-50.450	0.615	200	122.950	Hit
9	-0.980	400	-392.060	0.910	200	181.950	Hit
10	0.265	400	105.880	-0.259	200	-51.826	Hit
11	-1.814	400	-725.419	-0.672	200	-134.483	Hit
12	1.264	400	505.703	0.662	200	132.388	Hit
13	-1.204	400	-481.573	-0.430	200	-85.999	Hit
14	-0.058	400	-23.207	-1.577	200	-315.400	Miss
15	-0.139	400	-55.575	0.317	200	63.422	Hit
16	-0.160	400	-64.045	0.166	200	33.279	Hit
17	-1.248	400	-499.268	0.905	200	180.919	Hit
18	-0.136	400	-54.408	-0.764	200	-152.777	Hit
19	1.478	400	591.012	0.058	200	11.656	Hit
20	-0.380	400	-152.176	-0.577	200	-115.366	Hit
21	2.482	400	992.626	-0.747	200	-149.381	Hit
22	-0.124	400	-49.453	-0.444	200	-88.831	Hit
23	0.008	400	3.296	0.815	200	162.905	Hit
24	-1.780	400	-711.945	0.166	200	33.141	Hit
25	-0.645	400	-258.193	-0.627	200	-125.320	Hit
26	1.388	400	555.222	0.601	200	120.193	Hit
27	-0.536	400	-214.366	1.095	200	218.927	Miss
28	1.782	400	712.772	0.338	200	67.640	Hit
29	0.941	400	376.278	-0.123	200	-24.588	Hit
30	0.778	400	311.245	0.611	200	122.224	Hit
31	1.226	400	490.427	-0.635	200	-127.084	Hit
32	-1.589	400	-635.530	-0.443	200	-88.521	Hit
33	-1.212	400	-484.748	-2.010	200	-401.945	Miss
34	1.394	400	557.461	0.393	200	78.559	Hit
35	0.588	400	235.143	-1.336	200	-267.226	Miss
36	1.378	400	551.329	0.166	200	33.221	Hit
37	1.190	400	475.806	1.261	200	252.104	Miss
38	0.268	400	107.187	0.394	200	78.855	Hit
39	1.133	400	453.011	1.776	200	355.197	Miss
40	-2.207	400	-882.771	-0.573	200	-114.586	Hit
41	-0.727	400	-290.726	0.530	200	105.987	Hit
42	-1.216	400	-486.337	2.009	200	401.864	Miss
43	2.379	400	951.725	0.063	200	12.535	Hit

44	0.212	400	84.679	-0.263	200	-52.577	Hit
45	-0.924	400	-369.589	-0.400	200	-80.011	Hit
46	-1.040	400	-415.979	-0.047	200	-9.351	Hit
47	-0.500	400	-200.191	-0.137	200	-27.427	Hit
48	-0.319	400	-127.411	-0.282	200	-56.333	Hit
49	-0.139	400	-55.461	-0.489	200	-97.873	Hit
50	2.041	400	816.532	-1.426	200	-285.149	Miss
51	1.217	400	486.794	0.351	200	70.231	Hit
52	-1.173	400	-469.231	0.649	200	129.841	Hit
53	1.154	400	461.754	1.383	200	276.645	Miss
54	-1.202	400	-480.972	-0.237	200	-47.342	Hit
55	0.658	400	263.042	-0.236	200	-47.225	Hit
56	0.148	400	59.139	0.505	200	100.913	Hit
57	-1.508	400	-603.011	-2.138	200	-427.558	Miss
58	-0.478	400	-191.369	-0.587	200	-117.340	Hit
59	-0.013	400	-5.095	-2.289	200	-457.723	Miss
60	0.047	400	18.890	-0.052	200	-10.370	Hit
61	-0.453	400	-181.120	-1.645	200	-329.031	Miss
62	-0.018	400	-7.209	0.413	200	82.647	Hit
63	0.311	400	124.297	-0.356	200	-71.246	Hit
64	-0.851	400	-340.482	-0.673	200	-134.515	Hit
65	0.340	400	136.140	-0.616	200	-123.156	Hit
66	1.355	400	541.997	-1.815	200	-362.999	Miss
67	0.439	400	175.571	1.106	200	221.126	Miss
68	1.163	400	465.193	-1.220	200	-244.016	Miss
69	0.776	400	310.414	-0.668	200	-133.668	Hit
70	-1.339	400	-535.459	1.153	200	230.606	Miss
71	0.053	400	21.181	1.065	200	213.084	Miss
72	0.839	400	335.504	0.276	200	55.183	Hit
73	-0.953	400	-381.343	0.143	200	28.679	Hit
74	-0.374	400	-149.665	0.488	200	97.659	Hit
75	-0.538	400	-215.307	0.224	200	44.833	Hit
76	0.022	400	8.953	-0.680	200	-135.921	Hit
77	0.277	400	110.881	-0.215	200	-43.081	Hit
78	0.617	400	246.678	1.100	200	220.071	Miss
79	-0.665	400	-265.810	1.385	200	277.048	Miss
80	1.294	400	517.597	0.530	200	105.996	Hit
81	2.504	400	1001.470	-0.777	200	-155.311	Hit
82	-0.288	400	-115.174	0.634	200	126.880	Hit
83	0.870	400	347.885	-0.578	200	-115.663	Hit
84	-0.487	400	-194.869	0.671	200	134.207	Hit
85	0.150	400	60.121	-1.244	200	-248.890	Miss
86	-0.339	400	-135.451	0.192	200	38.362	Hit
87	-0.881	400	-352.549	-0.028	200	-5.662	Hit
88	1.260	400	504.120	0.289	200	57.879	Hit
89	-0.203	400	-81.309	-0.019	200	-3.759	Hit

90	0.552	400	220.811	0.120	200	24.084	Hit
91	-0.525	400	-209.963	-0.174	200	-34.883	Hit
92	0.253	400	101.249	-1.069	200	-213.752	Miss
93	-0.352	400	-140.792	0.079	200	15.875	Hit
94	-1.192	400	-476.839	-0.780	200	-156.056	Hit
95	-0.738	400	-295.322	0.097	200	19.381	Hit
96	-0.385	400	-153.873	0.403	200	80.697	Hit
97	-0.665	400	-265.913	1.982	200	396.306	Miss
98	0.317	400	126.658	-0.502	200	-100.500	Hit
99	-2.429	400	-971.500	-1.497	200	-299.403	Miss
100	0.875	400	349.940	-0.368	200	-73.678	Hit
101	-0.145	400	-58.032	-0.809	200	-161.715	Hit
102	-0.592	400	-236.832	-0.508	200	-101.627	Hit
103	-0.186	400	-74.594	-1.338	200	-267.535	Miss
104	0.897	400	358.939	-0.198	200	-39.677	Hit
105	-0.396	400	-158.482	0.311	200	62.224	Hit
106	-0.744	400	-297.498	-0.177	200	-35.472	Hit
107	0.657	400	262.617	-1.184	200	-236.881	Miss
108	-0.416	400	-166.243	-1.680	200	-335.901	Miss
109	-0.205	400	-82.198	1.209	200	241.834	Miss
110	-0.013	400	-5.169	-0.387	200	-77.383	Hit
111	-1.260	400	-504.114	0.590	200	118.095	Hit
112	1.935	400	774.069	0.867	200	173.402	Hit
113	-0.407	400	-162.713	0.594	200	118.846	Hit
114	0.387	400	154.924	-0.157	200	-31.396	Hit
115	0.021	400	8.444	0.280	200	56.031	Hit
116	1.653	400	661.273	0.165	200	33.071	Hit
117	-1.011	400	-404.563	-1.011	200	-202.214	Miss
118	0.226	400	90.450	0.365	200	72.913	Hit
119	1.212	400	484.625	-0.630	200	-126.047	Hit
120	-0.168	400	-67.010	-0.498	200	-99.620	Hit
121	0.063	400	25.001	-1.373	200	-274.572	Miss
122	1.156	400	462.492	-0.258	200	-51.672	Hit
123	0.462	400	184.828	-0.053	200	-10.608	Hit
124	1.114	400	445.519	0.898	200	179.525	Hit
125	0.274	400	109.448	-0.596	200	-119.148	Hit
126	-0.188	400	-75.316	-1.551	200	-310.236	Miss
127	0.223	400	89.339	-0.694	200	-138.795	Hit
128	0.755	400	302.029	-0.143	200	-28.503	Hit
129	0.206	400	82.556	-0.965	200	-193.024	Hit
130	-0.688	400	-275.085	-0.866	200	-173.296	Hit
131	-0.310	400	-124.073	-0.562	200	-112.388	Hit
132	-0.429	400	-171.690	0.354	200	70.766	Hit
133	3.187	400	1274.624	-0.182	200	-36.437	Hit
134	1.684	400	673.483	0.932	200	186.407	Hit
135	-0.567	400	-226.610	-0.952	200	-190.369	Hit

136	-0.710	400	-283.857	1.794	200	358.863	Miss
137	0.410	400	163.885	-2.162	200	-432.472	Miss
138	0.440	400	176.076	1.836	200	367.155	Miss
139	0.168	400	67.045	1.136	200	227.212	Miss
140	-0.505	400	-201.933	-0.694	200	-138.875	Hit
141	0.004	400	1.738	0.009	200	1.747	Hit
142	0.627	400	250.997	-0.792	200	-158.429	Hit
143	0.180	400	72.020	0.388	200	77.516	Hit
144	-0.156	400	-62.556	-0.344	200	-68.899	Hit
145	0.057	400	22.746	-0.261	200	-52.211	Hit
146	1.804	400	721.792	1.403	200	280.626	Miss
147	0.976	400	390.513	-0.664	200	-132.811	Hit
148	-0.345	400	-138.020	0.506	200	101.151	Hit
149	0.977	400	390.849	-0.819	200	-163.778	Hit
150	0.821	400	328.314	0.864	200	172.734	Hit
151	-2.470	400	-987.963	-1.280	200	-256.079	Miss
152	1.217	400	486.978	0.026	200	5.264	Hit
153	0.103	400	41.383	-1.063	200	-212.570	Miss
154	-0.164	400	-65.529	1.718	200	343.624	Miss
155	1.064	400	425.472	1.369	200	273.788	Miss
156	-0.782	400	-312.993	-0.367	200	-73.439	Hit
157	-1.266	400	-506.446	0.414	200	82.752	Hit
158	-0.139	400	-55.725	-1.758	200	-351.567	Miss
159	-1.428	400	-571.148	0.103	200	20.508	Hit
160	-1.057	400	-422.982	0.459	200	91.796	Hit
161	-1.769	400	-707.711	-1.183	200	-236.539	Miss
162	-1.050	400	-420.059	-0.499	200	-99.730	Hit
163	-0.393	400	-157.273	-2.930	200	-586.088	Miss
164	0.535	400	213.809	0.491	200	98.289	Hit
165	1.022	400	408.619	-0.130	200	-26.042	Hit
166	0.373	400	149.117	1.082	200	216.345	Miss
167	0.312	400	124.743	-1.476	200	-295.145	Miss
168	0.138	400	55.062	-0.018	200	-3.586	Hit
169	0.067	400	26.911	0.193	200	38.640	Hit
170	0.832	400	332.820	0.066	200	13.222	Hit
171	-2.387	400	-954.995	0.092	200	18.382	Hit
172	0.716	400	286.258	-0.223	200	-44.652	Hit
173	-2.350	400	-940.037	-0.117	200	-23.338	Hit
174	-0.278	400	-111.354	-1.391	200	-278.158	Miss
175	0.440	400	176.184	-0.837	200	-167.305	Hit
176	0.357	400	142.681	1.708	200	341.656	Miss
177	0.175	400	69.960	0.597	200	119.410	Hit
178	-0.622	400	-248.874	-0.732	200	-146.330	Hit
179	-0.390	400	-156.111	0.666	200	133.118	Hit
180	0.285	400	114.059	-1.605	200	-321.051	Miss
181	2.379	400	951.509	0.082	200	16.351	Hit

182	1.564	400	625.682	0.454	200	90.719	Hit
183	0.946	400	378.471	1.069	200	213.842	Miss
184	-1.143	400	-457.376	1.369	200	273.900	Miss
185	-0.164	400	-65.563	-1.937	200	-387.431	Miss
186	1.947	400	778.865	0.145	200	28.977	Hit
187	-0.204	400	-81.593	0.639	200	127.712	Hit
188	-0.514	400	-205.615	-2.924	200	-584.832	Miss
189	0.559	400	223.692	-0.538	200	-107.618	Hit
190	1.199	400	479.462	0.641	200	128.232	Hit
191	-0.778	400	-311.004	1.160	200	231.925	Miss
192	-1.066	400	-426.461	-0.356	200	-71.228	Hit
193	0.997	400	398.976	-2.900	200	-579.903	Miss
194	1.805	400	721.911	1.078	200	215.668	Miss
195	0.652	400	260.921	1.279	200	255.812	Miss
196	-0.777	400	-310.796	-1.483	200	-296.614	Miss
197	-2.529	400	-1011.744	-2.504	200	-500.824	Miss
198	0.709	400	283.689	-0.616	200	-123.294	Hit
199	-0.332	400	-132.978	-1.567	200	-313.391	Miss
200	0.261	400	104.315	-0.750	200	-149.908	Hit
201	-1.288	400	-515.018	-1.823	200	-364.595	Miss
202	0.767	400	306.873	1.696	200	339.271	Miss
203	0.541	400	216.238	0.160	200	31.909	Hit
204	-0.381	400	-152.557	-0.548	200	-109.633	Hit
205	0.115	400	45.962	1.062	200	212.452	Miss
206	-0.405	400	-162.151	-0.607	200	-121.424	Hit
207	-0.188	400	-75.255	0.860	200	172.039	Hit
208	0.235	400	94.022	-0.917	200	-183.304	Hit
209	0.589	400	235.506	1.355	200	270.908	Miss
210	0.477	400	190.771	-0.370	200	-73.967	Hit
211	-1.508	400	-603.355	-1.661	200	-332.213	Miss
212	-1.260	400	-504.058	0.838	200	167.559	Hit
213	-0.899	400	-359.509	-0.114	200	-22.827	Hit
214	-1.355	400	-542.007	-0.801	200	-160.246	Hit
215	0.894	400	357.446	0.642	200	128.456	Hit
216	-1.510	400	-604.027	0.816	200	163.195	Hit
217	0.448	400	179.067	0.269	200	53.739	Hit
218	0.393	400	157.034	-0.678	200	-135.607	Hit
219	2.645	400	1058.159	0.134	200	26.759	Hit
220	-2.353	400	-941.367	0.955	200	191.076	Hit
221	-0.814	400	-325.735	0.423	200	84.638	Hit
222	1.909	400	763.623	0.654	200	130.819	Hit
223	0.348	400	139.372	1.981	200	396.298	Miss
224	-2.291	400	-916.301	0.777	200	155.337	Hit
225	-1.107	400	-442.757	-1.493	200	-298.541	Miss
226	-0.092	400	-36.781	0.655	200	131.000	Hit
227	-0.942	400	-376.883	-0.203	200	-40.658	Hit

228	-1.293	400	-517.013	-0.645	200	-128.992	Hit
229	-1.825	400	-729.834	-1.923	200	-384.567	Miss
230	-0.129	400	-51.513	-0.077	200	-15.303	Hit
231	0.367	400	146.768	-0.236	200	-47.195	Hit
232	-0.992	400	-396.966	-0.946	200	-189.226	Hit
233	0.543	400	217.157	0.335	200	67.031	Hit
234	-0.592	400	-236.956	1.172	200	234.439	Miss
235	0.061	400	24.558	-0.798	200	-159.531	Hit
236	1.683	400	673.002	1.404	200	280.845	Miss
237	0.267	400	106.985	-0.030	200	-6.065	Hit
238	-1.109	400	-443.569	0.884	200	176.780	Hit
239	-0.687	400	-274.611	0.710	200	141.976	Hit
240	-0.485	400	-194.083	-2.425	200	-485.014	Miss
241	0.045	400	17.900	0.377	200	75.481	Hit
242	-0.141	400	-56.443	-1.097	200	-219.401	Miss
243	0.857	400	342.850	0.322	200	64.400	Hit
244	0.492	400	196.846	-1.399	200	-279.717	Miss
245	-0.284	400	-113.774	0.854	200	170.779	Hit
246	-1.448	400	-579.328	-0.486	200	-97.201	Hit
247	0.187	400	74.927	-1.616	200	-323.198	Miss
248	-1.231	400	-492.204	0.195	200	39.067	Hit
249	-0.484	400	-193.411	-0.982	200	-196.433	Hit
250	-0.108	400	-43.399	0.902	200	180.455	Hit
251	0.020	400	7.972	0.092	200	18.400	Hit
252	-0.183	400	-73.399	2.402	200	480.347	Miss
253	-0.538	400	-215.376	-1.595	200	-319.013	Miss
254	-1.001	400	-400.583	1.692	200	338.405	Miss
255	0.103	400	41.202	-0.387	200	-77.306	Hit
256	-0.777	400	-310.909	-1.509	200	-301.888	Miss
257	-0.169	400	-67.684	-0.172	200	-34.490	Hit
258	0.927	400	370.679	0.697	200	139.498	Hit
259	0.003	400	1.153	0.423	200	84.507	Hit
260	-1.051	400	-420.237	-0.342	200	-68.338	Hit
261	-0.841	400	-336.425	-0.391	200	-78.157	Hit
262	-0.927	400	-370.784	-1.965	200	-393.028	Miss
263	0.948	400	379.336	-1.818	200	-363.598	Miss
264	0.233	400	93.209	1.253	200	250.503	Miss
265	-1.194	400	-477.561	1.224	200	244.843	Miss
266	-0.869	400	-347.571	0.130	200	26.083	Hit
267	0.574	400	229.458	0.761	200	152.224	Hit
268	0.069	400	27.706	-0.649	200	-129.887	Hit
269	-1.090	400	-436.150	-2.968	200	-593.671	Miss
270	-3.367	400	-1346.962	-0.870	200	-174.054	Miss
271	0.455	400	182.119	-0.680	200	-136.023	Hit
272	-2.098	400	-839.396	1.068	200	213.513	Miss
273	-0.622	400	-248.964	-0.556	200	-111.144	Hit

274	-1.019	400	-407.744	-1.386	200	-277.228	Miss
275	-0.490	400	-196.157	-0.257	200	-51.495	Hit
276	-0.868	400	-347.129	-1.600	200	-319.950	Miss
277	-1.566	400	-626.398	-0.418	200	-83.679	Hit
278	-2.020	400	-808.030	-0.760	200	-152.013	Hit
279	-0.858	400	-343.004	-0.696	200	-139.129	Hit
280	-1.687	400	-674.739	0.817	200	163.420	Hit
281	-0.577	400	-230.695	0.248	200	49.667	Hit
282	0.511	400	204.312	-0.807	200	-161.307	Hit
283	0.431	400	172.322	-1.038	200	-207.628	Miss
284	-0.940	400	-376.135	1.781	200	356.106	Miss
285	-1.449	400	-579.523	-0.709	200	-141.869	Hit
286	1.129	400	451.640	-0.239	200	-47.850	Hit
287	0.760	400	304.148	1.840	200	368.072	Miss
288	-1.233	400	-493.166	2.228	200	445.583	Miss
289	-1.628	400	-651.007	-0.388	200	-77.596	Hit
290	-0.299	400	-119.490	0.814	200	162.759	Hit
291	-0.246	400	-98.567	0.782	200	156.400	Hit
292	0.527	400	210.927	-0.734	200	-146.766	Hit
293	-0.305	400	-122.153	-0.426	200	-85.244	Hit
294	-0.994	400	-397.641	0.240	200	48.056	Hit
295	0.041	400	16.237	0.300	200	59.928	Hit
296	-1.398	400	-559.292	-0.362	200	-72.423	Hit
297	0.562	400	224.740	-0.224	200	-44.716	Hit
298	-2.187	400	-874.613	0.817	200	163.439	Hit
299	-0.362	400	-144.673	-0.542	200	-108.404	Hit
300	0.627	400	250.778	-1.337	200	-267.469	Miss
301	0.713	400	285.352	1.875	200	375.062	Miss
302	0.307	400	122.649	-0.649	200	-129.732	Hit
303	-1.486	400	-594.504	-1.142	200	-228.346	Miss
304	-0.518	400	-207.015	-0.614	200	-122.882	Hit
305	1.261	400	504.470	0.348	200	69.652	Hit
306	-0.045	400	-17.889	-0.430	200	-85.922	Hit
307	0.560	400	224.097	1.849	200	369.899	Miss
308	-0.583	400	-233.313	0.073	200	14.627	Hit
309	-0.448	400	-179.084	0.235	200	46.915	Hit
310	-0.110	400	-44.168	-0.987	200	-197.361	Hit
311	-0.030	400	-12.114	1.839	200	367.896	Miss
312	0.350	400	140.089	0.316	200	63.246	Hit
313	-0.279	400	-111.533	-1.014	200	-202.846	Miss
314	-0.531	400	-212.429	-1.169	200	-233.704	Miss
315	-0.789	400	-315.663	1.396	200	279.102	Miss
316	0.212	400	84.616	0.410	200	81.967	Hit
317	1.015	400	405.828	-1.034	200	-206.838	Miss
318	0.075	400	30.133	1.074	200	214.751	Miss
319	0.301	400	120.477	1.214	200	242.867	Miss



320	-0.103	400	-41.211	-0.372	200	-74.440	Hit
321	-0.379	400	-151.455	0.922	200	184.480	Hit
322	-1.032	400	-412.728	-2.321	200	-464.105	Miss
323	-0.411	400	-164.372	0.824	200	164.787	Hit
324	1.381	400	552.421	-1.134	200	-226.864	Miss
325	0.033	400	13.272	0.464	200	92.797	Hit
326	-0.358	400	-143.344	-0.444	200	-88.739	Hit
327	-0.176	400	-70.475	-1.606	200	-321.242	Miss
328	-1.723	400	-689.321	0.154	200	30.850	Hit
329	2.250	400	899.822	0.412	200	82.378	Hit
330	0.343	400	137.222	-0.290	200	-57.914	Hit
331	0.834	400	333.493	0.950	200	189.916	Hit
332	0.423	400	169.381	-0.408	200	-81.562	Hit
333	0.004	400	1.614	0.042	200	8.462	Hit
334	1.293	400	517.242	0.358	200	71.657	Hit
335	-0.684	400	-273.414	-0.524	200	-104.888	Hit
336	-0.827	400	-330.941	-0.635	200	-127.001	Hit
337	-0.326	400	-130.501	-2.233	200	-446.516	Miss
338	-0.770	400	-307.804	-0.492	200	-98.413	Hit
339	-0.112	400	-44.963	1.234	200	246.788	Miss
340	-0.731	400	-292.293	-0.229	200	-45.899	Hit
341	0.466	400	186.335	2.223	200	444.584	Miss
342	0.435	400	173.976	0.096	200	19.182	Hit
343	0.115	400	46.158	-0.282	200	-56.392	Hit
344	-0.338	400	-135.341	-1.276	200	-255.220	Miss
345	0.377	400	150.865	-1.342	200	-268.448	Miss
346	-0.883	400	-353.172	-0.914	200	-182.752	Hit
347	0.260	400	103.968	-1.682	200	-336.375	Miss
348	1.467	400	586.877	-0.246	200	-49.211	Hit
349	1.206	400	482.414	0.047	200	9.480	Hit
350	0.153	400	61.388	-0.420	200	-83.983	Hit
351	-1.799	400	-719.790	-0.846	200	-169.160	Hit
352	0.365	400	145.883	0.775	200	155.026	Hit
353	1.169	400	467.561	-0.234	200	-46.765	Hit
354	-0.741	400	-296.252	0.204	200	40.886	Hit
355	0.469	400	187.644	-0.243	200	-48.517	Hit
356	0.359	400	143.669	-1.209	200	-241.803	Miss
357	0.890	400	356.060	-0.026	200	-5.151	Hit
358	-0.701	400	-280.510	-1.210	200	-242.090	Miss
359	0.318	400	127.340	-0.169	200	-33.842	Hit
360	-0.537	400	-214.725	1.701	200	340.238	Miss
361	-0.230	400	-91.855	-0.088	200	-17.525	Hit
362	1.114	400	445.598	0.006	200	1.251	Hit
363	-0.061	400	-24.273	-0.898	200	-179.616	Hit
364	0.856	400	342.492	0.351	200	70.123	Hit
365	0.335	400	133.840	-0.249	200	-49.796	Hit

366	1.303	400	521.057	1.118	200	223.665	Miss
367	-2.080	400	-832.009	1.341	200	268.292	Miss
368	0.086	400	34.539	0.309	200	61.754	Hit
369	-1.261	400	-504.340	-0.082	200	-16.385	Hit
370	-0.340	400	-136.150	1.225	200	244.958	Miss
371	1.584	400	633.466	1.710	200	342.026	Miss
372	-1.327	400	-530.911	-1.596	200	-319.278	Miss
373	-1.991	400	-796.489	-0.461	200	-92.223	Hit
374	1.577	400	630.734	1.627	200	325.426	Miss
375	2.541	400	1016.434	-0.006	200	-1.267	Hit
376	-0.890	400	-355.992	-0.465	200	-93.080	Hit
377	-0.015	400	-5.953	0.064	200	12.774	Hit
378	0.544	400	217.792	-1.202	200	-240.379	Miss
379	-0.448	400	-179.112	1.344	200	268.713	Miss
380	-1.143	400	-457.314	-1.696	200	-339.267	Miss
381	-0.287	400	-114.844	-0.829	200	-165.740	Hit
382	-1.798	400	-719.389	0.257	200	51.350	Hit
383	-0.574	400	-229.540	0.871	200	174.131	Hit
384	0.649	400	259.552	-0.236	200	-47.203	Hit
385	1.028	400	411.094	-0.952	200	-190.378	Hit
386	-0.029	400	-11.607	1.600	200	320.097	Miss
387	-1.310	400	-524.112	1.251	200	250.221	Miss
388	-1.127	400	-450.813	-0.788	200	-157.649	Hit
389	-1.480	400	-592.195	0.484	200	96.799	Hit
390	-0.646	400	-258.305	1.463	200	292.663	Miss
391	-1.297	400	-518.786	0.682	200	136.478	Hit
392	0.266	400	106.527	0.381	200	76.283	Hit
393	-0.923	400	-369.385	-0.633	200	-126.600	Hit
394	-0.276	400	-110.350	-0.760	200	-152.030	Hit
395	-0.184	400	-73.594	1.255	200	250.967	Miss
396	0.723	400	289.178	1.073	200	214.563	Miss
397	-1.776	400	-710.472	0.448	200	89.585	Hit
398	0.049	400	19.518	-1.056	200	-211.270	Miss
399	0.537	400	214.782	0.142	200	28.305	Hit
400	-0.638	400	-255.241	-0.815	200	-162.922	Hit
401	-1.588	400	-635.070	-0.464	200	-92.827	Hit
402	-1.674	400	-669.786	0.830	200	165.973	Hit
403	-0.592	400	-236.650	1.780	200	356.071	Miss
404	0.262	400	104.895	0.312	200	62.482	Hit
405	0.793	400	317.191	0.763	200	152.600	Hit
406	-0.365	400	-146.131	0.167	200	33.454	Hit
407	-0.647	400	-258.695	-0.306	200	-61.257	Hit
408	-1.315	400	-525.849	0.454	200	90.773	Hit
409	0.398	400	159.367	0.820	200	164.024	Hit
410	1.152	400	460.692	1.348	200	269.528	Miss
411	-1.686	400	-674.594	0.839	200	167.856	Hit

412	-0.165	400	-66.069	0.458	200	91.698	Hit
413	-0.084	400	-33.703	-1.310	200	-261.962	Miss
414	0.513	400	205.235	2.910	200	581.919	Miss
415	0.000	400	0.168	-0.308	200	-61.586	Hit
416	0.518	400	207.135	-0.446	200	-89.190	Hit
417	-0.618	400	-247.053	-1.310	200	-261.978	Miss
418	-0.183	400	-73.089	-1.345	200	-268.958	Miss
419	-0.273	400	-109.238	-0.419	200	-83.826	Hit
420	-0.026	400	-10.471	0.719	200	143.720	Hit
421	-1.145	400	-457.955	-0.374	200	-74.881	Hit
422	-1.011	400	-404.579	-0.870	200	-174.067	Hit
423	-0.110	400	-43.864	-1.502	200	-300.320	Miss
424	-0.859	400	-343.505	1.491	200	298.149	Miss
425	-0.196	400	-78.422	-1.090	200	-217.969	Miss
426	-2.433	400	-973.329	1.288	200	257.673	Miss
427	1.070	400	427.958	0.145	200	29.016	Hit
428	-0.439	400	-175.403	0.225	200	45.092	Hit
429	0.612	400	244.691	2.366	200	473.160	Miss
430	-0.957	400	-382.759	-0.331	200	-66.114	Hit
431	1.402	400	560.740	1.516	200	303.206	Miss
432	-0.025	400	-9.917	0.308	200	61.630	Hit
433	0.940	400	375.844	0.761	200	152.172	Hit
434	-0.969	400	-387.745	0.106	200	21.189	Hit
435	-1.544	400	-617.702	-1.780	200	-355.952	Miss
436	0.111	400	44.362	2.076	200	415.249	Miss
437	-0.032	400	-12.753	0.037	200	7.413	Hit
438	0.630	400	252.126	-0.171	200	-34.137	Hit
439	-0.416	400	-166.432	0.209	200	41.708	Hit
440	-1.471	400	-588.530	0.163	200	32.592	Hit
441	-0.542	400	-216.653	1.321	200	264.147	Miss
442	0.352	400	140.656	-0.087	200	-17.442	Hit
443	-0.709	400	-283.595	-1.817	200	-363.346	Miss
444	1.551	400	620.428	-1.900	200	-379.942	Miss
445	-1.077	400	-430.777	0.467	200	93.354	Hit
446	0.166	400	66.440	2.082	200	416.378	Miss
447	0.703	400	281.330	-0.318	200	-63.603	Hit
448	-0.704	400	-281.770	1.079	200	215.769	Miss
449	-0.296	400	-118.397	0.736	200	147.293	Hit
450	-0.038	400	-15.205	-1.553	200	-310.562	Miss
451	-1.619	400	-647.521	0.004	200	0.766	Hit
452	-1.601	400	-640.274	0.639	200	127.749	Hit
453	1.163	400	465.153	1.181	200	236.216	Miss
454	-0.371	400	-148.414	-0.532	200	-106.322	Hit
455	0.172	400	68.706	-0.647	200	-129.483	Hit
456	2.061	400	824.443	2.315	200	462.953	Miss
457	0.526	400	210.410	-0.930	200	-186.011	Hit

458	0.498	400	199.060	1.760	200	351.968	Miss
459	1.337	400	534.682	0.810	200	162.040	Hit
460	0.757	400	302.830	0.630	200	125.902	Hit
461	1.895	400	757.939	0.530	200	106.057	Hit
462	1.721	400	688.315	0.193	200	38.520	Hit
463	0.933	400	373.196	-0.592	200	-118.310	Hit
464	-2.146	400	-858.265	0.956	200	191.270	Hit
465	0.237	400	94.951	-2.167	200	-433.338	Miss
466	1.680	400	672.053	0.067	200	13.441	Hit
467	0.570	400	227.907	1.020	200	203.975	Miss
468	0.665	400	266.179	0.805	200	160.976	Hit
469	0.518	400	207.201	-1.130	200	-226.029	Miss
470	-0.017	400	-6.973	-0.079	200	-15.834	Hit
471	0.429	400	171.732	-0.006	200	-1.102	Hit
472	-1.839	400	-735.426	-1.154	200	-230.825	Miss
473	0.028	400	11.166	-0.321	200	-64.295	Hit
474	0.145	400	57.818	-1.628	200	-325.584	Miss
475	-1.054	400	-421.463	0.023	200	4.613	Hit
476	-0.798	400	-319.363	-1.198	200	-239.510	Miss
477	1.252	400	500.671	1.131	200	226.265	Miss
478	0.363	400	145.248	0.812	200	162.343	Hit
479	0.412	400	164.910	0.030	200	5.922	Hit
480	0.295	400	118.153	-1.035	200	-207.013	Miss
481	2.827	400	1130.902	-0.107	200	-21.446	Hit
482	0.325	400	130.102	1.082	200	216.395	Miss
483	-0.018	400	-7.205	0.071	200	14.129	Hit
484	-0.644	400	-257.514	-2.673	200	-534.612	Miss
485	-0.265	400	-106.068	0.682	200	136.413	Hit
486	-0.274	400	-109.720	0.566	200	113.114	Hit
487	-1.050	400	-419.840	-0.256	200	-51.234	Hit
488	-0.645	400	-257.977	-0.543	200	-108.655	Hit
489	0.235	400	94.059	-0.120	200	-24.070	Hit
490	-1.750	400	-700.000	1.205	200	240.918	Miss
491	0.290	400	116.060	-0.329	200	-65.772	Hit
492	0.488	400	195.214	1.077	200	215.418	Miss
493	0.586	400	234.452	-0.411	200	-82.275	Hit
494	-1.858	400	-743.018	1.358	200	271.649	Miss
495	0.679	400	271.757	0.608	200	121.644	Hit
496	-2.480	400	-991.810	-2.427	200	-485.413	Miss
497	0.555	400	222.065	0.192	200	38.392	Hit
498	-1.390	400	-556.176	-2.547	200	-509.406	Miss
499	-1.490	400	-596.151	0.228	200	45.638	Hit
500	1.399	400	559.764	1.165	200	233.019	Miss
501	-0.668	400	-267.018	-0.937	200	-187.321	Hit
502	3.046	400	1218.305	0.692	200	138.376	Hit
503	1.756	400	702.488	1.088	200	217.646	Miss

504	-0.191	400	-76.201	-0.209	200	-41.732	Hit
505	-0.743	400	-297.081	0.833	200	166.685	Hit
506	-1.700	400	-679.819	1.283	200	256.564	Miss
507	0.366	400	146.517	1.247	200	249.496	Miss
508	-0.051	400	-20.376	0.959	200	191.771	Hit
509	-3.018	400	-1207.068	0.794	200	158.897	Hit
510	-0.281	400	-112.325	0.135	200	27.002	Hit
511	-0.400	400	-159.853	-0.175	200	-35.044	Hit
512	1.036	400	414.210	1.584	200	316.835	Miss
513	0.386	400	154.398	-0.849	200	-169.818	Hit
514	-0.177	400	-70.807	0.459	200	91.771	Hit
515	0.610	400	243.810	0.267	200	53.353	Hit
516	0.371	400	148.239	1.240	200	247.924	Miss
517	-0.733	400	-293.110	0.382	200	76.471	Hit
518	-0.129	400	-51.674	-2.117	200	-423.434	Miss
519	0.959	400	383.769	1.324	200	264.890	Miss
520	2.728	400	1091.311	1.006	200	201.289	Miss
521	-1.009	400	-403.547	-1.308	200	-261.660	Miss
522	-0.762	400	-304.682	1.310	200	262.030	Miss
523	0.632	400	252.811	0.690	200	137.968	Hit
524	-0.274	400	-109.566	0.164	200	32.848	Hit
525	-0.493	400	-197.286	-2.010	200	-401.983	Miss

526	-0.024	400	-9.410	0.424	200	84.898	Hit
527	-0.819	400	-327.749	-0.465	200	-92.918	Hit
528	0.191	400	76.337	0.224	200	44.890	Hit
529	-0.569	400	-227.740	-0.403	200	-80.553	Hit
530	-2.094	400	-837.749	0.600	200	120.089	Hit
531	-1.637	400	-654.944	0.767	200	153.384	Hit
532	-1.179	400	-471.421	-2.374	200	-474.834	Miss
533	0.976	400	390.426	0.486	200	97.186	Hit
534	-0.216	400	-86.559	0.062	200	12.313	Hit
535	1.243	400	497.169	2.063	200	412.546	Miss
536	-0.978	400	-391.305	-0.695	200	-138.918	Hit
537	-0.454	400	-181.471	-1.014	200	-202.761	Miss
538	1.499	400	599.512	-0.860	200	-172.009	Hit
539	-0.181	400	-72.451	-1.786	200	-357.282	Miss
540	0.039	400	15.757	-1.404	200	-280.849	Miss
541	0.179	400	71.415	0.009	200	1.809	Hit
542	-0.907	400	-362.791	0.344	200	68.775	Hit
543	-0.523	400	-209.030	-0.043	200	-8.680	Hit
544	0.203	400	81.261	-0.653	200	-130.656	Hit
545	-0.441	400	-176.205	-0.083	200	-16.506	Hit
546	1.284	400	513.750	-1.200	200	-240.040	Miss
547	-1.573	400	-629.002	-0.167	200	-33.485	Hit
548	-1.765	400	-706.154	-0.503	200	-100.669	Hit
549	0.330	400	131.871	-1.978	200	-395.696	Miss
550	0.364	400	145.542	-0.252	200	-50.327	Hit
551	0.872	400	348.610	-1.112	200	-222.333	Miss
552	-1.404	400	-561.789	0.291	200	58.258	Hit
553	-1.217	400	-486.948	-1.457	200	-291.359	Miss
554	0.608	400	243.148	-1.051	200	-210.131	Miss
555	0.157	400	62.613	0.719	200	143.797	Hit
556	-1.145	400	-458.037	-0.702	200	-140.360	Hit
557	0.734	400	293.597	-0.528	200	-105.576	Hit
558	1.287	400	514.779	0.577	200	115.328	Hit
559	1.252	400	500.863	0.676	200	135.191	Hit
560	-2.107	400	-842.905	-0.548	200	-109.536	Hit
561	-0.658	400	-263.105	0.520	200	104.049	Hit
562	1.871	400	748.222	1.778	200	355.689	Miss
563	-0.230	400	-92.196	-0.672	200	-134.472	Hit
564	0.669	400	267.539	-0.016	200	-3.276	Hit
565	1.645	400	657.873	-0.188	200	-37.605	Hit
566	-1.525	400	-609.920	-2.225	200	-445.033	Miss
567	0.638	400	255.381	-1.153	200	-230.560	Miss
568	-1.360	400	-544.037	-0.078	200	-15.631	Hit
569	0.848	400	339.393	0.749	200	149.881	Hit
570	-0.256	400	-102.212	-0.796	200	-159.180	Hit