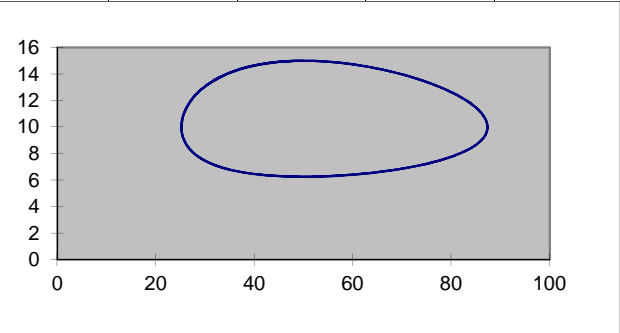
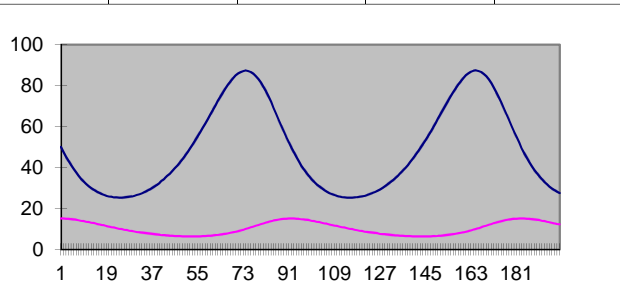


Lotka-Volterra Model of a Predator-Prey System						
Time	Prey	Predator				
t	H(t)	P(t)	$dH/dt = rH - aPH$	Parameters		
0	50	15	$dP/dt = bPH - mP$	<i>r</i>	0,1	
1	47,5625	14,98125		<i>a</i>	0,01	
2	45,26077	14,92705		<i>b</i>	0,001	
3	43,1013	14,83987		<i>m</i>	0,05	
4	41,08726	14,72243				
5	39,21908	14,57757				
6	37,495	14,40825				
7	35,91159	14,21736				
8	34,46422	14,00779				
9	33,14739	13,78225				
10	31,95515	13,54338				
11	30,88127	13,2936				
12	29,91952	13,03517				
13	29,06375	12,77019				
14	28,3081	12,50054				
15	27,64699	12,22795				
16	27,07526	11,95395				
17	26,58813	11,67992				
18	26,18126	11,40709				
19	25,85078	11,13655				
20	25,59321	10,86924				
21	25,4055	10,606				
22	25,28505	10,34755				
23	25,2296	10,09453				
24	25,23729	9,847459				
25	25,30661	9,606816				
26	25,43638	9,372992				
27	25,62574	9,146323				
28	25,87412	8,927094				
29	26,18123	8,715542				
30	26,54703	8,511869				
31	26,97172	8,316243				
32	27,45572	8,128806				
33	27,99967	7,949678				
34	28,60438	7,778963				
35	29,27081	7,616752				
36	30,0001	7,463129				
37	30,7935	7,318171				
38	31,65233	7,181957				
39	32,57802	7,054568				
40	33,57203	6,936089				
41	34,63583	6,826617				
42	35,77085	6,72626				
43	36,97846	6,635142				
44	38,25991	6,553406				
45	39,61627	6,481216				



46	41,04837	6,41876						
47	42,55674	6,366256						
48	44,1415	6,32395						
49	45,80232	6,292126						
50	47,53826	6,271101						
51	49,3477	6,261233						
52	51,22821	6,262924						
53	53,17641	6,27662						
54	55,18783	6,302812						
55	57,25676	6,342042						
56	59,37608	6,394897						
57	61,53711	6,462014						
58	63,72945	6,544072						
59	65,94083	6,641791						
60	68,15695	6,755923						
61	70,3614	6,88724						
62	72,53556	7,036521						
63	74,65863	7,204528						
64	76,70762	7,391983						
65	78,65755	7,599534						
66	80,48168	7,827716						
67	82,1519	8,076901						
68	83,63926	8,347246						
69	84,91463	8,638631						
70	85,94958	8,950591						
71	86,71727	9,282254						
72	87,1936	9,632272						
73	87,35835	9,998766						
74	87,19627	10,37929						
75	86,69818	10,77079						
76	85,86181	11,16964						
77	84,69244	11,57168						
78	83,20314	11,97226						
79	81,4146	12,36639						
80	79,35454	12,74888						
81	77,05671	13,1145						
82	74,55957	13,45818						
83	71,90466	13,77521						
84	69,13491	14,06135						
85	66,293	14,31306						
86	63,41977	14,52753						
87	60,553	14,7028						
88	57,7264	14,83773						
89	54,96902	14,93202						
90	52,3049	14,98611						
91	49,75313	15,00113						
92	47,32803	14,97876						
93	45,03957	14,92117						
94	42,8939	14,83084						
95	40,89387	14,71052						
96	39,03967	14,56307						
97	37,32935	14,39143						

98	35,75934	14,19851						
99	34,32489	13,98717						
100	33,02046	13,76014						
101	31,84004	13,52002						
102	30,77739	13,26921						
103	29,82627	13,00999						
104	28,98057	12,74439						
105	28,23442	12,47431						
106	27,58231	12,20145						
107	27,01909	11,92732						
108	26,54004	11,6533						
109	26,14086	11,3806						
110	25,8177	11,11027						
111	25,56713	10,84328						
112	25,38616	10,58043						
113	25,2722	10,32244						
114	25,22305	10,06993						
115	25,23687	9,823428						
116	25,3122	9,583397						
117	25,44787	9,350223						
118	25,64307	9,124237						
119	25,89724	8,905717						
120	26,21013	8,694899						
121	26,58172	8,491978						
122	27,01223	8,297121						
123	27,50211	8,110467						
124	28,05201	7,932135						
125	28,66275	7,762227						
126	29,33534	7,600832						
127	30,0709	7,448033						
128	30,87069	7,303909						
129	31,73607	7,168537						
130	32,66846	7,041999						
131	33,66932	6,924381						
132	34,74011	6,81578						
133	35,88228	6,716307						
134	37,09718	6,626086						
135	38,38604	6,545262						
136	39,74993	6,474002						
137	41,18964	6,412497						
138	42,70567	6,360966						
139	44,29811	6,319661						
140	45,96656	6,288867						
141	47,71003	6,268905						
142	49,52684	6,260139						
143	51,41445	6,262974						
144	53,36941	6,27786						
145	55,38711	6,305294						
146	57,46173	6,345822						
147	59,58599	6,400037						
148	61,75107	6,468579						
149	63,94638	6,552133						

150	66,15945	6,651422					
151	68,3758	6,767201					
152	70,57878	6,900244					
153	72,74957	7,051329					
154	74,86713	7,221218					
155	76,90828	7,410626					
156	78,84783	7,620195					
157	80,65889	7,850444					
158	82,31322	8,101729					
159	83,78181	8,374184					
160	85,03555	8,667657					
161	86,04608	8,981649					
162	86,7868	9,315243					
163	87,2339	9,667043					
164	87,36758	10,03512					
165	87,17313	10,41695					
166	86,64199	10,80945					
167	85,77261	11,20893					
168	84,57102	11,61116					
169	83,05105	12,01146					
170	81,23412	12,40481					
171	79,1486	12,78601					
172	76,82879	13,14983					
173	74,31354	13,49124					
174	71,64461	13,80553					
175	68,86503	14,08856					
176	66,01736	14,33682					
177	63,14223	14,54761					
178	60,27707	14,71903					
179	57,45517	14,85004					
180	54,70512	14,94039					
181	52,05048	14,99062					
182	49,50986	15,0019					
183	47,09714	14,97597					
184	44,82189	14,91504					
185	42,68989	14,82162					
186	40,70374	14,69847					
187	38,86337	14,54848					
188	37,16665	14,37457					
189	35,60986	14,17967					
190	34,18816	13,96661					
191	32,89595	13,73813					
192	31,72717	13,49678					
193	30,67557	13,24499					
194	29,73492	12,98499					
195	28,89912	12,71881					
196	28,16235	12,44832					
197	27,51909	12,1752					

H'(t)	P'(t)	H(t+0.5)	P(t+0.5)	H'(t+0.5)	P'(t+0.5)
-2,5	0	48,75	15	-2,4375	-0,01875
-2,36921	-0,03652	46,3779	14,96299	-2,30173	-0,0542
-2,23002	-0,07074	44,14576	14,89168	-2,15947	-0,08718
-2,08605	-0,10238	42,05828	14,78869	-2,01404	-0,11745
-1,94032	-0,13122	40,1171	14,65682	-1,86818	-0,14485
-1,79528	-0,15716	38,32144	14,49899	-1,72408	-0,16933
-1,65287	-0,18018	36,66857	14,31816	-1,58341	-0,19088
-1,51452	-0,2003	35,15433	14,11721	-1,44738	-0,20958
-1,38125	-0,21762	33,77359	13,89897	-1,31682	-0,22553
-1,25372	-0,23227	32,52053	13,66612	-1,19224	-0,23888
-1,13229	-0,24439	31,389	13,42118	-1,07388	-0,24978
-1,0171	-0,25416	30,37272	13,16652	-0,96176	-0,25842
-0,90811	-0,26175	29,46546	12,9043	-0,85576	-0,26498
-0,80512	-0,26736	28,66119	12,63651	-0,75566	-0,26965
-0,70786	-0,27116	27,95417	12,36496	-0,66111	-0,2726
-0,61596	-0,27333	27,33901	12,09128	-0,57174	-0,274
-0,52904	-0,27404	26,81074	11,81692	-0,48713	-0,27403
-0,44666	-0,27345	26,3648	11,5432	-0,40686	-0,27283
-0,3684	-0,2717	25,99707	11,27124	-0,33049	-0,27054
-0,29381	-0,26894	25,70388	11,00208	-0,25757	-0,26731
-0,22247	-0,26528	25,48197	10,7366	-0,1877	-0,26324
-0,15396	-0,26085	25,32853	10,47558	-0,12046	-0,25845
-0,08788	-0,25574	25,24111	10,21969	-0,05545	-0,25303
-0,02385	-0,25005	25,21767	9,969504	0,00769	-0,24707
0,038497	-0,24385	25,25654	9,725534	0,069321	-0,24064
0,099502	-0,23722	25,35636	9,488203	0,129773	-0,23382
0,159488	-0,23023	25,51612	9,257875	0,189362	-0,22667
0,218761	-0,22293	25,73512	9,034856	0,248381	-0,21923
0,277605	-0,21537	26,01293	8,819407	0,307107	-0,21155
0,336287	-0,20759	26,34937	8,611745	0,365796	-0,20367
0,395055	-0,19963	26,74455	8,412054	0,424689	-0,19563
0,454138	-0,19151	27,19878	8,220488	0,484006	-0,18744
0,51375	-0,18326	27,7126	8,037177	0,543949	-0,17913
0,574083	-0,1749	28,28671	7,86223	0,604705	-0,17071
0,635314	-0,16644	28,92203	7,695745	0,666437	-0,16221
0,697596	-0,15789	29,61961	7,537808	0,729292	-0,15362
0,761064	-0,14926	30,38064	7,388498	0,793391	-0,14496
0,825829	-0,14056	31,20641	7,247893	0,858834	-0,13621
0,891976	-0,13177	32,09832	7,116071	0,925693	-0,12739
0,959564	-0,1229	33,0578	6,993115	0,99401	-0,11848
1,028617	-0,11395	34,08634	6,879116	1,063795	-0,10947
1,099127	-0,10489	35,18539	6,774174	1,135019	-0,10036
1,171044	-0,09571	36,35637	6,678406	1,207611	-0,09112
1,244272	-0,0864	37,60059	6,591943	1,28145	-0,08174
1,318664	-0,07694	38,91924	6,514937	1,35636	-0,07219
1,394011	-0,0673	40,31327	6,447566	1,432102	-0,06246

1,470041	-0,05746	41,78339	6,390031	1,508367	-0,0525
1,546403	-0,04739	43,32994	6,342563	1,584765	-0,04231
1,622664	-0,03705	44,95283	6,305426	1,660816	-0,03182
1,698292	-0,02641	46,65146	6,27892	1,735938	-0,02103
1,772654	-0,01544	48,42458	6,263382	1,809442	-0,00987
1,844995	-0,00408	50,2702	6,259191	1,880512	0,001691
1,914437	0,007692	52,18543	6,26677	1,948202	0,013696
1,97996	0,019937	54,16639	6,286589	2,011421	0,026192
2,040398	0,032698	56,20803	6,319161	2,068927	0,03923
2,094428	0,046023	58,30397	6,365053	2,119318	0,052855
2,140569	0,059959	60,44636	6,424877	2,161032	0,067117
2,177175	0,074553	62,6257	6,49929	2,192344	0,082058
2,202444	0,089847	64,83068	6,588995	2,211378	0,097719
2,214431	0,105876	67,04805	6,694729	2,21612	0,114132
2,211064	0,122667	69,26248	6,817257	2,204447	0,131317
2,190181	0,140234	71,45649	6,957357	2,174166	0,14928
2,149576	0,158572	73,61035	7,115807	2,123065	0,168007
2,087061	0,177654	75,70216	7,293354	2,048989	0,187455
2,000548	0,197422	77,70789	7,490694	1,949929	0,207551
1,888148	0,217784	79,60162	7,708426	1,82413	0,228182
1,748291	0,238602	81,35582	7,947017	1,670221	0,249185
1,579862	0,259688	82,94183	8,206745	1,487359	0,270345
1,382351	0,280795	84,33043	8,487644	1,275377	0,291384
1,156002	0,301615	85,49263	8,789438	1,034941	0,31196
0,901963	0,32177	86,40056	9,111476	0,76769	0,331663
0,62241	0,340819	87,02847	9,452663	0,476339	0,350018
0,320636	0,358259	87,35392	9,811401	0,164749	0,366494
0,001078	0,373537	87,35889	10,18553	-0,16208	0,38052
-0,33072	0,386071	87,03091	10,57232	-0,4981	0,391503
-0,66826	0,395268	86,36405	10,96842	-0,83637	0,398856
-1,00428	0,400564	85,35967	11,36993	-1,16936	0,402037
-1,3311	0,40145	84,02689	11,77241	-1,4893	0,400578
-1,64098	0,397517	82,38265	12,17102	-1,78854	0,39413
-1,92659	0,388485	80,45131	12,56063	-2,06006	0,382488
-2,18136	0,374237	78,26386	12,936	-2,29782	0,365621
-2,39993	0,354835	75,85675	13,29192	-2,49714	0,343686
-2,57841	0,330527	73,27037	13,62345	-2,65491	0,317023
-2,71455	0,301741	70,54738	13,92608	-2,76975	0,286144
-2,80781	0,269063	67,73101	14,19588	-2,84191	0,251707
-2,85926	0,233203	64,86337	14,42966	-2,87323	0,214473
-2,87135	0,194956	61,9841	14,62501	-2,86677	0,175268
-2,84769	0,155159	59,12916	14,78038	-2,8266	0,134932
-2,79265	0,114642	56,33008	14,89505	-2,75739	0,094287
-2,71108	0,074197	53,61347	14,96912	-2,66412	0,054091
-2,60798	0,034541	51,00091	15,00338	-2,55177	0,015017
-2,48822	-0,0037	48,50902	14,99928	-2,4251	-0,02236
-2,35635	-0,04002	46,14985	14,95875	-2,28846	-0,05759
-2,21647	-0,07402	43,93134	14,88416	-2,14568	-0,09033
-2,07214	-0,10539	41,85783	14,77815	-2,00003	-0,12033
-1,92631	-0,13396	39,93071	14,64354	-1,8542	-0,14745
-1,78141	-0,15962	38,14897	14,48326	-1,71032	-0,17164
-1,63929	-0,18235	36,50971	14,30025	-1,57001	-0,19291

-1,50136	-0,2022	35,00866	14,09741	-1,43445	-0,21134
-1,36859	-0,21925	33,6406	13,87755	-1,30443	-0,22703
-1,24162	-0,23364	32,39966	13,64332	-1,18042	-0,24013
-1,12077	-0,24552	31,27965	13,39725	-1,06265	-0,2508
-1,00618	-0,25507	30,2743	13,14168	-0,95112	-0,25923
-0,89777	-0,26246	29,37739	12,87876	-0,8457	-0,26559
-0,79534	-0,26788	28,5829	12,61045	-0,74614	-0,27008
-0,69861	-0,27151	27,88512	12,33856	-0,65211	-0,27287
-0,60721	-0,27353	27,27871	12,06468	-0,56322	-0,27413
-0,52074	-0,2741	26,75872	11,79027	-0,47905	-0,27402
-0,43879	-0,27339	26,32065	11,51661	-0,39918	-0,27271
-0,3609	-0,27153	25,96041	11,24483	-0,32316	-0,27032
-0,28665	-0,26867	25,67437	10,97594	-0,25057	-0,267
-0,2156	-0,26493	25,45933	10,71081	-0,18097	-0,26285
-0,14735	-0,26042	25,31249	10,45021	-0,11396	-0,25799
-0,08149	-0,25525	25,23146	10,19481	-0,04915	-0,25251
-0,01764	-0,2495	25,21423	9,945175	0,013824	-0,2465
0,044561	-0,24326	25,25915	9,701798	0,075323	-0,24003
0,105451	-0,23659	25,36492	9,4651	0,135677	-0,23317
0,165354	-0,22957	25,53055	9,23544	0,195196	-0,22599
0,224572	-0,22224	25,75536	9,013118	0,254175	-0,21852
0,283389	-0,21465	26,03894	8,798391	0,312886	-0,21082
0,342069	-0,20685	26,38116	8,591473	0,371586	-0,20292
0,400858	-0,19887	26,78214	8,392544	0,430511	-0,19486
0,459985	-0,19073	27,24222	8,201755	0,489882	-0,18665
0,519661	-0,18247	27,76194	8,019233	0,549899	-0,17833
0,580078	-0,17409	28,34205	7,845088	0,610746	-0,16991
0,641407	-0,16562	28,98346	7,679414	0,672586	-0,16139
0,703804	-0,15707	29,68724	7,522298	0,735561	-0,1528
0,767399	-0,14843	30,4546	7,373817	0,799794	-0,14412
0,832302	-0,13972	31,28685	7,23405	0,865379	-0,13537
0,898595	-0,13093	32,18537	7,103074	0,932386	-0,12654
0,966333	-0,12205	33,15163	6,980974	1,000856	-0,11762
1,03554	-0,11308	34,18709	6,867841	1,070794	-0,1086
1,106202	-0,10401	35,29321	6,763776	1,142167	-0,09947
1,178264	-0,09482	36,47141	6,668897	1,2149	-0,09022
1,251627	-0,0855	37,72299	6,583338	1,288867	-0,08082
1,326137	-0,07602	39,04911	6,507254	1,363886	-0,07126
1,401582	-0,06636	40,45072	6,440822	1,439713	-0,06151
1,47768	-0,0565	41,92848	6,384249	1,51603	-0,05153
1,554074	-0,0464	43,48271	6,337767	1,592438	-0,04131
1,630321	-0,03603	45,11327	6,301644	1,668449	-0,03079
1,70588	-0,02537	46,8195	6,276184	1,743472	-0,01996
1,780107	-0,01436	48,60009	6,261727	1,816804	-0,00877
1,852235	-0,00296	50,45295	6,258658	1,887617	0,002835
1,921371	0,008859	52,37514	6,267404	1,954953	0,014886
1,986484	0,021153	54,36265	6,288437	2,017704	0,027434
2,046391	0,033967	56,41031	6,322278	2,074614	0,040528
2,099754	0,047351	58,5116	6,369498	2,124265	0,054215
2,145074	0,061351	60,65853	6,430712	2,165077	0,068542
2,18069	0,076013	62,84141	6,506585	2,195311	0,083554
2,204786	0,091379	65,04877	6,597822	2,213075	0,099289

2,215401	0,107483	67,26716	6,705163	2,216343	0,115779
2,210452	0,124353	69,48102	6,829377	2,202981	0,133043
2,18777	0,141999	71,67266	6,971243	2,170791	0,151085
2,145145	0,160415	73,82214	7,131537	2,117561	0,169888
2,080394	0,179571	75,90733	7,311003	2,041145	0,189409
1,991443	0,199407	77,904	7,51033	1,939552	0,209568
1,876425	0,219826	79,78604	7,730108	1,811057	0,230249
1,733808	0,240686	81,52579	7,970787	1,654332	0,251285
1,562528	0,261793	83,09448	8,232626	1,46859	0,272454
1,362138	0,282895	84,46288	8,515631	1,25374	0,293473
1,132965	0,303676	85,60203	8,819495	1,010536	0,313992
0,876251	0,323753	86,48421	9,143526	0,740715	0,333594
0,594279	0,342678	87,08394	9,486582	0,447104	0,3518
0,290451	0,359942	87,37913	9,847014	0,133678	0,368073
-0,03068	0,374988	87,35224	10,22261	-0,19445	0,381837
-0,36347	0,387231	86,99139	10,61057	-0,53114	0,3925
-0,70133	0,39608	86,29132	11,00749	-0,86938	0,399476
-1,03693	0,400973	85,25414	11,40942	-1,20159	0,402229
-1,36257	0,40141	83,88973	11,81186	-1,51997	0,400301
-1,67054	0,396991	82,21578	12,20996	-1,81693	0,393353
-1,95353	0,387453	80,25736	12,59854	-2,08552	0,381199
-2,20509	0,372694	78,04606	12,97236	-2,31981	0,363824
-2,41998	0,352794	75,6188	13,32623	-2,51526	0,341402
-2,59446	0,32802	73,01631	13,65525	-2,66893	0,314293
-2,72646	0,298815	70,28138	13,95494	-2,77959	0,283025
-2,81558	0,265781	67,45723	14,22145	-2,84767	0,248267
-2,86306	0,229638	64,58583	14,45164	-2,87513	0,210789
-2,87146	0,191188	61,70649	14,64321	-2,86516	0,171421
-2,84449	0,151268	58,85482	14,79467	-2,82189	0,131004
-2,7866	0,11071	56,06188	14,90539	-2,75005	0,090355
-2,70265	0,070296	53,3538	14,97554	-2,65464	0,050225
-2,59764	0,030738	50,75166	15,00599	-2,54062	0,011279
-2,47643	-0,00735	48,27164	14,99822	-2,41272	-0,02592
-2,34354	-0,04347	45,92537	14,95424	-2,27525	-0,06093
-2,20301	-0,07723	43,72038	14,87642	-2,13199	-0,09342
-2,05835	-0,10835	41,66072	14,76745	-1,98615	-0,12315
-1,91245	-0,13664	39,74751	14,63015	-1,84037	-0,15
-1,76769	-0,16202	37,97953	14,46747	-1,69672	-0,17391
-1,62588	-0,18447	36,35371	14,28233	-1,55679	-0,1949
-1,48837	-0,20405	34,86567	14,07765	-1,4217	-0,21306
-1,35611	-0,22084	33,51011	13,8562	-1,29222	-0,22849
-1,22969	-0,23498	32,2811	13,62064	-1,16878	-0,24134
-1,10943	-0,24662	31,17245	13,37347	-1,05159	-0,25179
-0,99542	-0,25595	30,17786	13,11702	-0,94065	-0,26001
-0,88758	-0,26314	29,29113	12,85342	-0,8358	-0,26618
-0,78571	-0,26838	28,50627	12,58462	-0,73678	-0,27049
-0,6895	-0,27184	27,81759	12,3124	-0,64325	-0,27312
-0,59859	-0,27371	27,2198	12,03834	-0,55483	-0,27424