

Rational Function Modeling

The following are sets of data taken from environmental studies or scientific experiments. In each case, use a rational function to model the data and discuss what the horizontal asymptotes of the rational function imply in each situation.

The following set of data is from a population study of trout in a pond. The time steps are years and the population is the estimated number of trout in the pond. Data was collected using standard tagging techniques.

Time (years)	Population
0	5938
1	6316
2	6575
3	6743
4	6847
5	6910
6	6947
7	6969

The following set of data is from a population study of Fruit Flies. The time steps are in days and the population is the actual fly count.

Time (days)	Population
1	434
2	508
3	583
4	656
5	724
6	784
7	834
8	876
9	908
10	933
11	952
12	966
13	976
14	983
15	988

The following set of data is from an experiment on radioactivity. The time steps are in days and the Relative Activity is a number calculated from a Geiger counter reading.

Time (days)	Relative Activity
0.2	35.0
2.2	25.0
4.0	22.1
5.0	17.9
6.0	16.8
8.0	13.7
11.0	12.4
12.0	10.3
15.0	7.5
18.0	4.9
26.0	4.0
33.0	2.4
39.0	1.4
45.0	1.1

The following set of data is from a study on the height of a Sorghum plant during the growing season. The time steps are in days and the height of the plant is in centimeters.

Time (days)	Height (cm)
56	32
64	50
72	66
80	72
88	82
96	83