

1 Logistic Behavior

In your groups, use the graph to answer the following questions.

1. What are the equilibrium value(s) of this population? How do you know?

✚ Solution (click to open)
2. If the population's value is 20 individuals, is the overall feedback amplifying or stabilizing? How do you know?

✚ Solution (click to open)
3. If the population's value is 80 individuals, is the overall feedback amplifying or stabilizing? How do you know?

✚ Solution (click to open)
4. For which population values is the overall feedback amplifying? stabilizing?

✚ Solution (click to open)
5. For initial population values between 0 and 100, does the population ever decrease with time? How do you know?

✚ Solution (click to open)



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2 Step 1: Stabilizing/Amplifying, Increasing/Decreasing

Work in your group to match each population over time graph below to the correct description.
Write a short summary explaining your choices.

A.

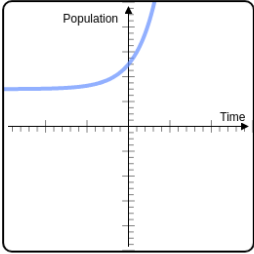


Figure: A line graph showing a population increasing at an increasing rate over time.

B.

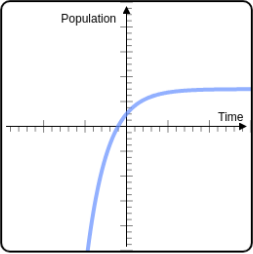


Figure: A line graph showing a population increasing at a decreasing rate over time.

C.

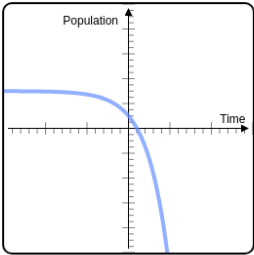


Figure: A line graph showing a population decreasing at a decreasing rate over time.

D.

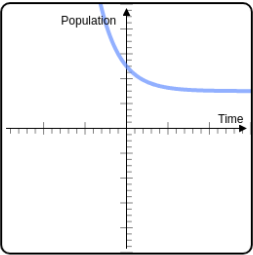







Figure: A line graph showing a population decreasing at an increasing rate over time.

Amplifying and Increasing: 

Amplifying and Decreasing: 

Stabilizing and Increasing: 

Stabilizing and Decreasing: 

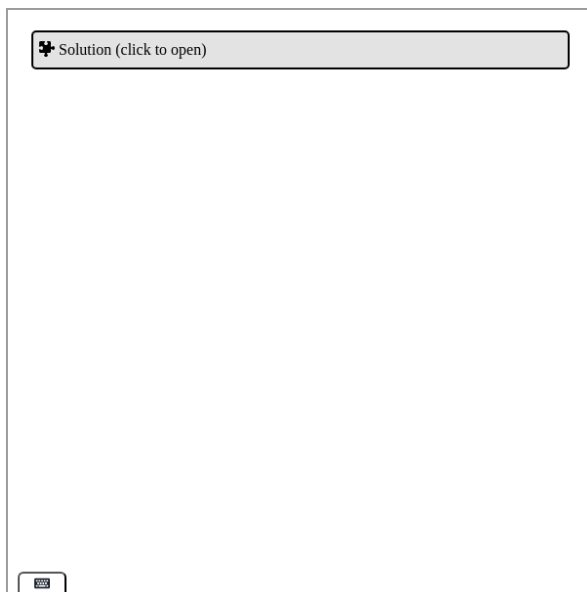




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3 Logistic Line Graphs

Work in your group to sketch a line graph of the population over time for each of the initial population values $P_0 = 20$, $P_0 = 50$, and $P_0 = 105$. When you have graphs your group agrees upon, use the interactive provided to check your work.




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1. In what ways is the line graph for the logistic model similar to that of the exponential model? In what ways is it different?

4 Logistic Equations and Graphs

Below you will be given a growth rate and carrying capacity for a population. From that you will be asked to write the equation of the net flow rate using the logistic model. When this is correct, you will be asked to sketch the behavior of the population over time for different initial population values.

The growth rate when a population P is small is 0.16 and the carrying capacity is 122.

Enter the net flow rate in terms of " P " using the logistic model: 





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1. Choose new variations of the problem with the “New Variation” button. Before moving on, get at least 3 correct in a row, and write down an explanation for how to translate the net flow rate in a logistic model to population behavior over time as if you were explaining it to someone new.