1 Absolute and Relative Change Part 1

Let's practice calculating both the absolute change:

$$\text{New Meaurement} - \text{Old Measurement}$$

and the relative change:

$$\frac{\text{New Meaurement}}{\text{Old Measurement}}$$

of this population on each time interval given below.

	Absolute Change	Relative Change Multiple
$t = 0$ to $t = 1$		
$t = 1$ to $t = 2$		
$t = 2$ to $t = 3$		
$t = 3$ to $t = 4$		

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1. As a group, make some observation about this table:

- How does the absolute change of these measurements behave from one time interval to the next?
- How does the relative change of these measurements behave from one time interval to the next?

2 Absolute and Relative Change Part 2

Use the table below to calculate both the absolute change and the relative change of this amount on each time interval given.

	Absolute Change	Relative Change Multiple
$t = 0$ to $t = 1$		
$t = 1$ to $t = 2$		
$t = 2$ to $t = 3$		
$t = 3$ to $t = 4$		

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1. As a group, make some observation about this table:

- How does the absolute change of these measurements behave from one time interval to the next?
- How does the relative change of these measurements behave from one time interval to the next?
- How are these behaviors different from and similar to the behaviors you observed for Worksheet 1?

3 Exponential Graphs

Below we'll practice graphing the family of exponential relationships $f(x) = a \cdot b^x + c$. Use the sliders for each parameter to change the graph to a new exponential relationship that goes through all three points given.

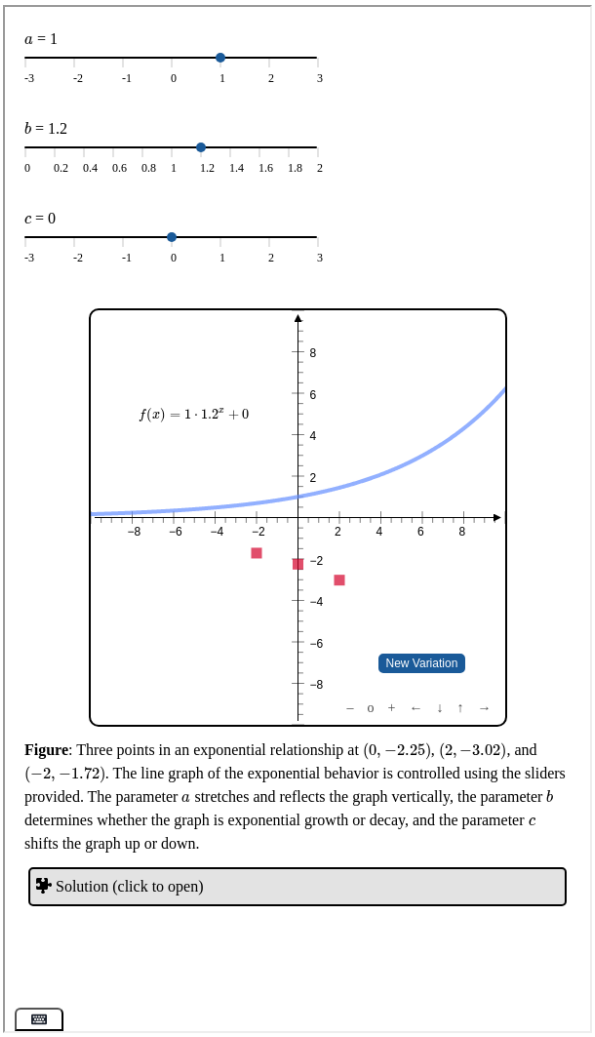

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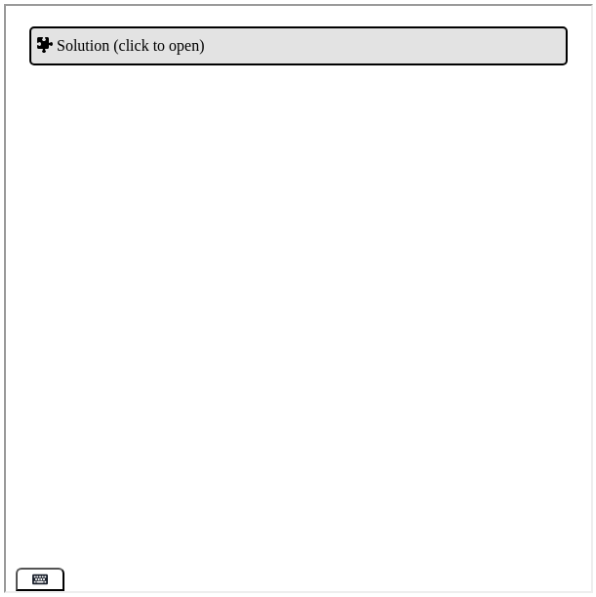
Figure: Three points in an exponential relationship at $(0, -2.25)$, $(2, -3.02)$, and $(-2, -1.72)$. The line graph of the exponential behavior is controlled using the sliders provided. The parameter a stretches and reflects the graph vertically, the parameter b determines whether the graph is exponential growth or decay, and the parameter c shifts the graph up or down.

Solution (click to open)

1. Choose new variations of the problem with the "New Variation" button. Before moving on, attempt at least 3 different versions, and write down observations for how graphs of exponential relationships can behave as if you were explaining it to someone new.

4 Stock Behavior Over Time

On a separate sheet of paper, sketch what you think the line graph would look like for the stock over time for each of the initial stock values of $S = 5$, $S = 6$, and $S = 7$. After your group has discussed your responses, you can use the interactive below to check your answers.



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5 Stabilizing and Amplifying Exponential Behavior

Work in your group to put these ideas together by grouping together all graphs and equations that are stabilizing and amplifying. Separate your answers with a comma.

A. Net Flow $= -2x + 6$

B. Net Flow $= 2x - 6$

C.

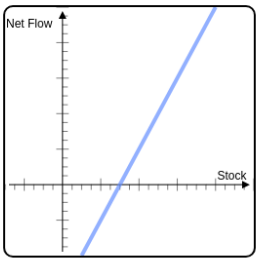

Figure: A line graph showing that the net flow increases linearly as the stock value increases.

D.

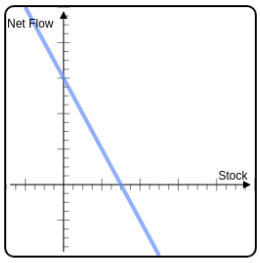

Figure: A line graph showing that the net flow decreases linearly as the stock value increases.

E.

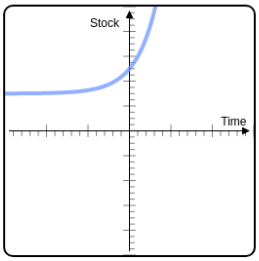

Figure: A line graph showing that the stock value increases rapidly without bound as time increases.

F.

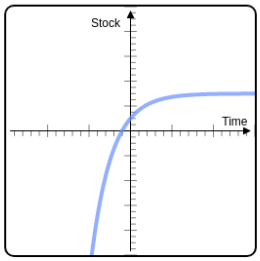

Figure: A line graph showing that the stock value increases slowly approaching a specific value as time increases.

G.

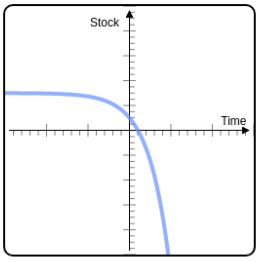

Figure: A line graph showing that the stock value decreases rapidly without bound as time increases.

H.

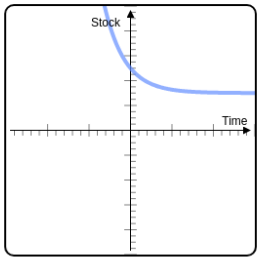

Figure: A line graph showing that the stock value decreases slowly approaching a specific value as time increases.

Enter the capital letter corresponding to all graphs and equations that are **amplifying**:

Enter the capital letter corresponding to all graphs and equations that are **stabilizing**:

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