

Lesson 3.2.4: Comparing Linear and Exponential Functions

Targets:

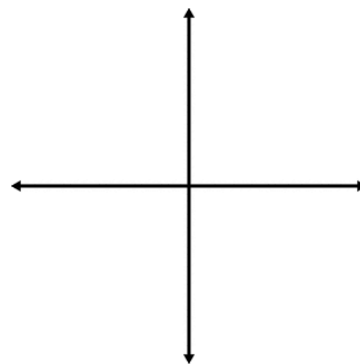
1. I understand the difference between linear and exponential models and how they change over equal lengths of intervals.

Warm Up:

1. What is “slope-intercept form”?
What does the m and b represent?
2. What is exponential form?
What does the a and b stand for?

Practice 1

Sketch points $P1 = (0, 4)$ and $P2 = (4, 12)$. Are there values of m and b such that the graph of the linear function described by $f(x) = mx + b$ contains $P1$ and $P2$? If so, find those values. If not, explain why they do not exist.

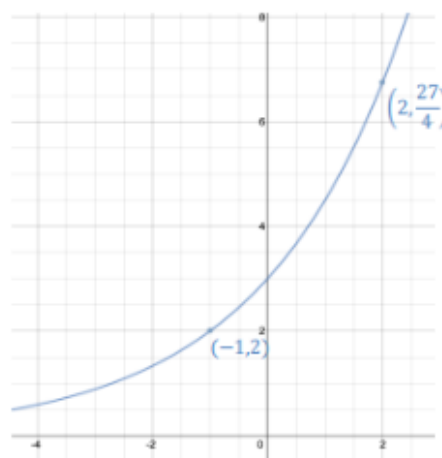


Practice 2

Graphs (a) and (b) are both graphs of an exponential function of the form $g(x) = a \cdot b^x$. Rewrite the function $g(x)$ using the values for a and b that are required for the graph shown to be a graph of g .

a.) $g(x) =$

b.) $g(x) =$



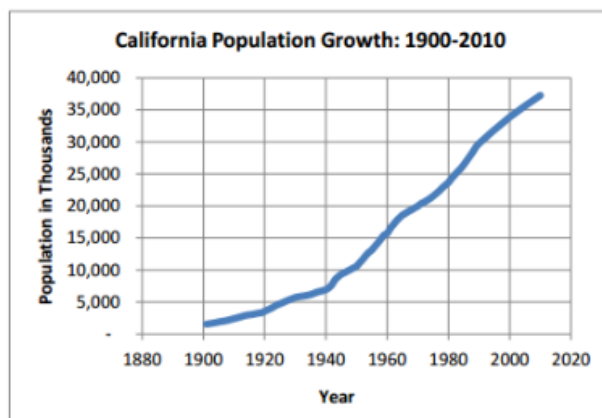
Practice 3

A California Population Projection Engineer in 1920 was tasked with finding a model that predicts the state's population growth. He modeled the population growth as a function of time, t years since 1900. Census data shows that the population in 1900, in thousands, was 1,490. In 1920, the population of the state of California was 3,554 thousand. He decided to explore both a linear and an exponential model.

- Use the data provided to determine the equation of the linear function that models the population growth from 1900–1920.
- Use the data provided and your calculator to determine the equation of the exponential function that models the population growth.
- Use the two functions to predict the population for the following years:

	Projected Population Based on Linear Function, $f(t)$ (thousands)	Projected Population Based on Exponential Function, $g(t)$ (thousands)	Census Population Data and Intercensal Estimates for California (thousands)
1935			
1960			
2010			

- Which function is a better model for the population growth of California in 1935 and in 1960?
- Does either model closely predict the population for 2010? What phenomenon might explain the real population value?



Exit Ticket:

Khan Academy Activity: “Constructing Linear and Exponential Functions”

- Go to Khan Academy and sign in.
- Search for the activity by typing the name in the search box.
- Click on the activity.
- Get 3 right in a row.
- Show me that you completed the activity.