2.7H I Can See—Can't You?

A Solidify Understanding Task

Kwan's parents bought a home for $50,000 in 1997 just as real estate values in the area started to rise quickly. Each year, their house was worth more until they sold the home in 2007 for $309,587.

1. Model the growth of the home's value from 1997 to 2007 with both a linear and an exponential equation. Graph the two models below.
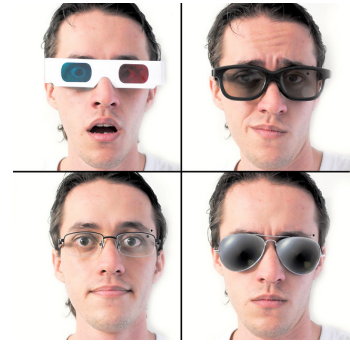
Linear model:

Exponential model:
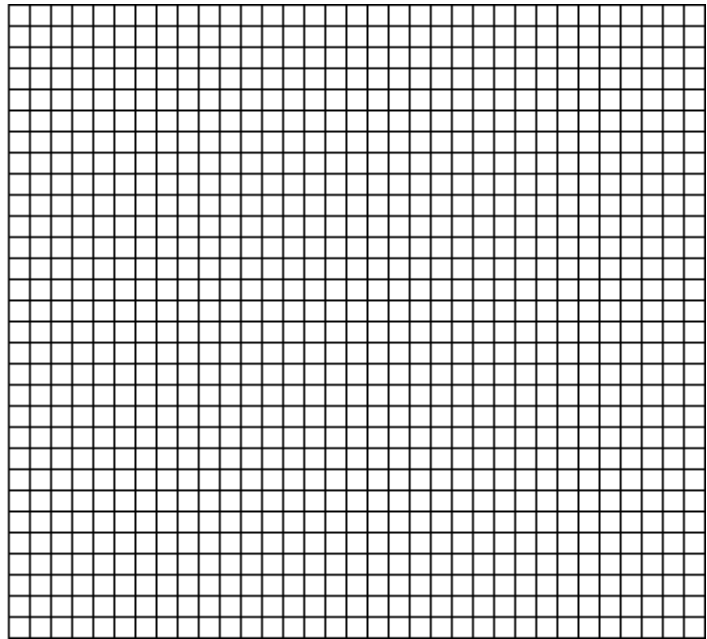
2. What was the change in the home's value from 1997 to 2007?

The average rate of change is defined as the change in y (or *f(x)*) divided by the change in x.

3. What was the average rate of change of the linear function from 1997 to 2007?

4. What is the average rate of change of the exponential function in the interval from 1997 to 2007?

5. How do the average rates of change from 1997 to 2007 compare for the two functions? Explain.

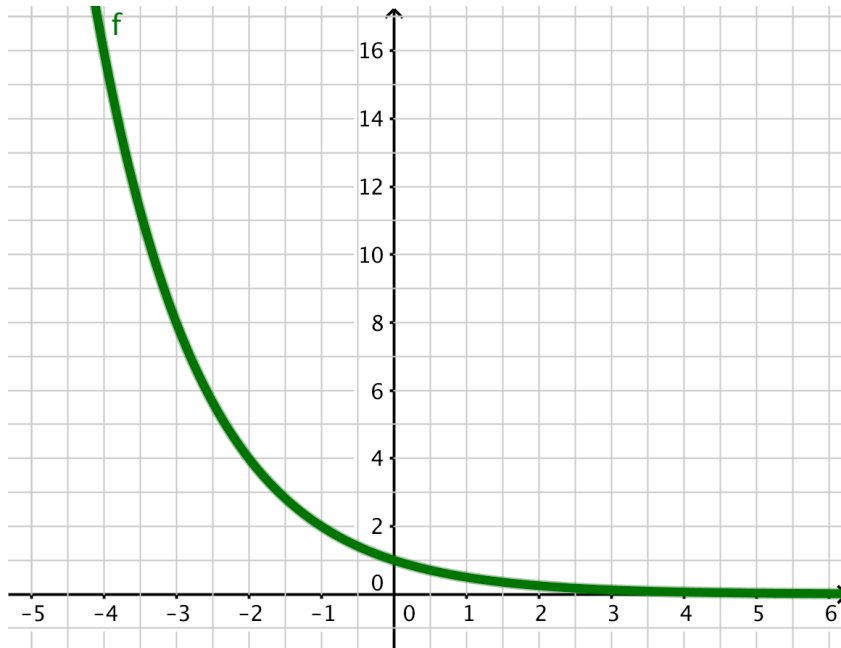6. What was the average rate of change of the linear function from 1997 to 2002?

7. What is the average rate of change of the exponential function in the interval from 1997 to 2002?

8. How do the average rates of change from 1997 to 2002 compare for the two functions? Explain.

9. How can you use the equation of the exponential function to find the average rate of change over a given interval?

How does this process compare to finding the slope of the line through the endpoints of the interval?

SECONDARY MATH 1 // MODULE 2

LINEAR & EXPONENTIAL FUNCTIONS – 2.7H

Consider the following graph:

10. What is the equation of the graph shown?

11. What is the average rate of change of this function on the interval from x = -3 to x = 1?

12. What is the average rate of change of this function in the interval from x = -3 to x = 0?

13. What is the average rate of change of this function in the interval from x = -3 to x = -1?

14. What is the average rate of change of this function in the interval from x = -3 to x = -1.5?

15. Draw the line through the point at the beginning and end of each of the intervals in 11, 12, 13 and 14. What is the slope of each of these lines?

16. Which of these average rates of change best represents the change at the point (-2, 4)? Explain your answer.

17. How does the average rate of change compare to the change factor for an exponential function? What is described by each of these quantities?