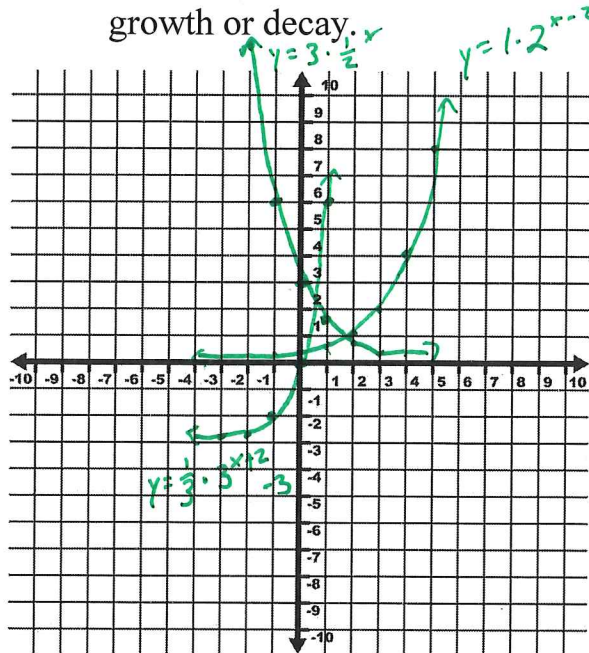


NAME: Key

Review:

1. Graph the following functions and label whether or not they are exponential growth or decay.



a. $y = 3 * (\frac{1}{2})^x$

b. $y = 1 * 2^{x-2}$

c. $y = \frac{1}{3} * 3^{x+2} - 3$

2. A runner is training for a marathon, running a total of 20 miles per week on a regular basis. She plans to increase the distance in miles according to the function $y = 20(1.1)^x$ where y is distance and x is weeks of training. The runner's goal is to work up to 50 miles per week. What is the first week that the total will be 50 miles or more?

$y = 20(1.1)^1 =$
 $y = 20(1.1)^2 =$
 $y = 20(1.1)^3 =$

$y = 20(1.1)^4 =$
 $y = 20(1.1)^5 =$
 $y = 20(1.1)^6 = 35$
 $y = 20(1.1)^7 = 38.9$

$y = 20(1.1)^8 =$
 $y = 20(1.1)^9 = 47.15$
 $y = 20(1.1)^{10} = 51.87$

10 weeks

3. Determine if the following graph is exponential growth or decay describe the shifts when graphed.

a. $y = 3 * (\frac{7}{8})^x$

Decay

b. $y = 12221323 * (\frac{1}{2})^x - 5$

Decay
shifted down
5 units

c. $y = \frac{1}{10} * (\frac{8}{7})^{x-3} + 4$

growth
shifted up 4 units
and right 3 units

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4. In 1995, the population of West Virginia reached 1,821,000, it's highest in the 20th century. For the next five years its population decreased 0.2% each year. If this trend continues, predict the population of West Virginia 2010.

$$y = 1821000(1 - .002)^5$$
$$y = 1,767,128$$

5. Determine the amount of an investment if \$400 is invested at a rate of 7.25% compounded quarterly for 7 years.

$$A = 400 \left(1 + \frac{.0725}{4}\right)^{4 \cdot 7}$$

$$A = 661.44$$

6. You invest in an account that is continuously compounding. The initial amount you put in is \$10,000. The rate is 3% and the money is in the account for 18 years. How much is the account worth after 18 years.

$$A = 10000 e^{.03 \cdot 18}$$

$$A = 17160.07$$

7. Find the common ratio from the following sequences

a. 1, 3, 9, ... 3

b. 2, 5, 12.5, ... 2.5 or $\frac{5}{2}$

c. 6, 8, $32/3$, ... $\frac{4}{3}$ or $1.\bar{3}$

8. Find the given term of the geometric sequence

- a. The 3rd term if the first term is 3 and the common ratio is 4

$$a_3 = 3 \cdot 4^{3-1} \quad a_3 = 48$$

- b. The 6th term if the first term is 2 and the common ratio is -3

$$a_6 = 2(-3)^{6-1} \quad a_6 = -486$$

- c. The 10th term if the first term is 2 and the common ratio is 1

$$a_{10} = 2 \cdot 1^{10-1} \quad a_{10} = 2$$

- d. The 5th term if the first term is 1024 and the common ratio is $\frac{1}{2}$

$$a_5 = 1024 \cdot \left(\frac{1}{2}\right)^{5-1}$$

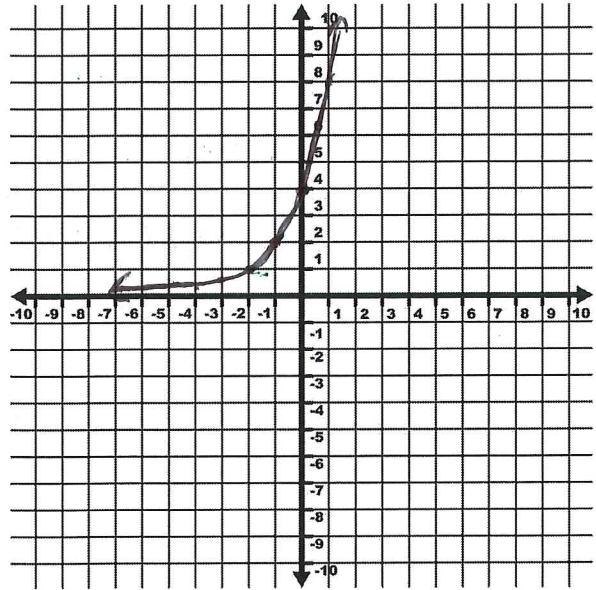
$$a_5 = 64$$

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13. Write the equation that best represents the graph.

Answers will
change

$$y = 1.2^{x+2}$$



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9. Find the geometric mean between 7 and 343

49

$a_1 = 7$
 $a_3 = 343$
 $a_n = a_1 \cdot r^{n-1}$
 $a_3 = 7 \cdot r^{3-1}$
 $343 = 7 \cdot r^2$
 $49 = r^2$
 $r = \pm 7$
 $a_2 = 7 \cdot 7^{2-1}$
 $a_2 = 7 \cdot 7$
 $a_2 = \pm 49$

10. Find the geometric mean between 528 and 33.

$a_2 = \pm 132$

$a_1 = 528$
 $a_3 = 33$
 $\frac{33}{528} = \frac{528 \cdot r^2}{528}$
 $r^2 = .0625$
 $r = \pm \frac{1}{4}$

11. Find the geometric mean between 64 and 2048

$a_2 = \pm 362.038$

$a_1 = 64$
 $a_3 = 2048$
 $2048 = 64 \cdot r^2$
 $32 = r^2$
 $r = \pm 5.6568$

12. A lake was closed because of an accidental pesticide spill. The concentration of pesticide after the spill was 848 parts per million. Each day the water is tested, and the amount of pesticide is found to be at 75% of what there was the day before.

- a. List the level of pesticide for the first 5 days
- b. If a safe level of pesticide is considered to be 12 parts per million or less, when will the lake be considered safe?

$y = 848(1-.75)^x$

- t=1 ~~y=212~~ 636
- t=2 ~~y=53~~ 477
- t=3 ~~y=13~~ 357.75
- 268.3125
- 201.234
- 150.925
- 113.194
- 84.895
- 63.67
- 47.753
- 35.815
- 26.861
- 20.146
- 15.109

11.33221499

After 15 days.