

Algebra 1

Chapter 8 Exponential Equations REVIEW, Lessons 8.3, 8.5, 8.6  
(Show your work, please!)

Simplify each expression.

1.  $x^6 \cdot x^5$   
 $x^{11}$

2.  $(x^4)^3$   
 $x^{12}$

3.  $(2x^3)^3$   
 $8x^9$

4.  $\frac{5x^7}{15x^4}$   
 $\frac{x^3}{3}$

5.  $(6x^3)(3x)^2$   
 $54x^5$

Simplify the expression. When using exponents in your answer, they must be positive.

6.  $\frac{1}{t^{-2}}$   
 $t^2$

7.  $5x(2x)^0$   
 $5x$

8.  $\frac{3c^3d^{-2}}{cd^2}$   
 $\frac{3c^2}{d^4}$

9. Write an exponential equation for the table.

x	-2	-1	2	3
y	1000	100	0.1	0.01

$y = 10(0.1)^x$

10. Write an exponential equation for the table.

x	-3	-2	1	2
y	3	6	48	96

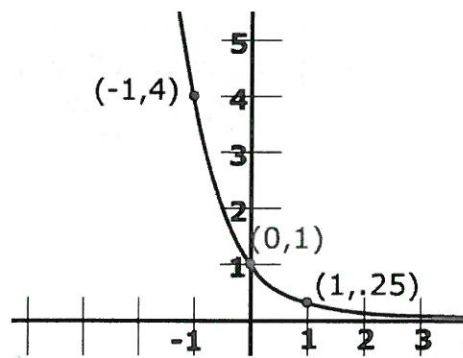
$y = 24(2)^x$

11. Decide whether the graph represents exponential growth or decay.  
Then write an equation for the function.

Exponential Decay

$y = 1(0.25)^x$

x	y
-1	4
0	1
1	0.25



12a. Seth has \$2,100 in a saving account that earns 3% interest each year. Write a function that models the value of the savings account over time.

$y = 2100(1 + 0.03)^x$

12b. How much will Seth have in his account after 15 years?

\$ 3271.73

13a. Coach Stokes bought a car for \$19,000 in 2005. Due to depreciation and use, the value of the car declined by about 14% per year. Write a function that models the value of the ~~tractor~~ <sup>car</sup> over time.

$y = 19000(1 - 0.14)^x$

\*\*Using your answer from 13a on the front\*\*

13b. Estimate when will the car be worth less than \$5,000?

$$x \approx 9 \text{ years}$$

13c. How much will the car be worth in 2018?

$$(\$2674.44) \quad (x=13)$$

14a. An adult takes 30 mg of Motrin. Each hour, the amount of Motrin in the person's system decreases by about 9%. Write a function that models the amount of Motrin in the body over time.

$$y = 30(1 - 0.09)^x$$

14b. How much Motrin is left after 6 hours?

$$17.036 \text{ mg}$$

15a. A chicken farm has 800 flies. The number of flies increases at a rate of about 3.2% per day. Write a function that models the amount of flies over time.

$$y = 800(1 + 0.032)^x$$

15b. Estimate how many days it will take for the number of flies to be more than double the initial amount of flies.

$$x \approx 23 \text{ days}$$

1600

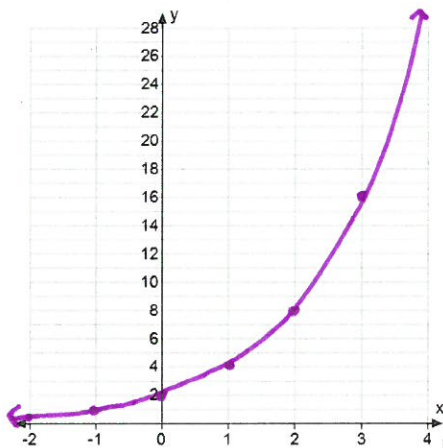
Determine if each is a growth or decay. Then, write the exponential equation for the following table of values and graph the function.

16.

Exponential Growth

$$y = 2(2)^x$$

x	y
-2	0.5
-1	1
2	8
3	16
4	32



17.

Exponential Decay

$$y = 24(0.5)^x$$

x	y
-1	48
0	24
1	12
2	6
4	1.5

