Practice

Exploring Exponential Models

Complete the table of values for each function. Then graph the function.

2. $y = 0.5(2)^x$

x	$0.5(2)^x$	y
−1	$0.5(2)^{-1}$	
0		
1		
2		
3		
4		

4. $y = 2(0.5)^x$

x	$2(0.5)^x$	y
−2		
−1		
0		
1		
2		

Without graphing, determine whether the function represents exponential growth or exponential decay. Then find the y-intercept.

7. $y = 0.99\left(\frac{1}{3}\right)^x$

8. $y = 20(1.75)^x$

9. $y = 185\left(\frac{5}{4}\right)^x$

10. $f(x) = \frac{2}{3}\left(\frac{1}{2}\right)^x$

11. $f(x) = 0.25(1.05)^x$

12. $y = \frac{1}{5}\left(\frac{6}{5}\right)^x$

17. Identify the meaning of the variables in the exponential growth or decay function.
$$A(t) = a(1+r)^t$$

a. $a =$ _____

b. $r =$ _____

c. $t =$ _____

18. The population of Bainsville is 2000. The population is supposed to grow by 10% each year for the next 5 years. How many people will live in Bainsville in 5 years?
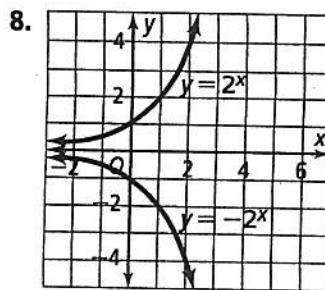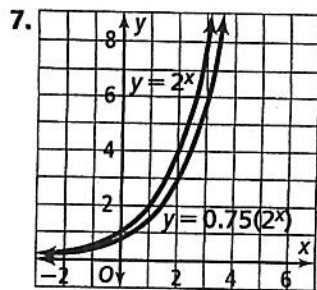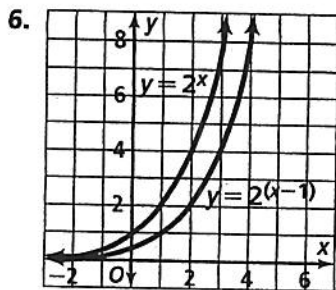
Write an exponential function to model each situation. Find each amount after the specified time.

14. A population of 1,236,000 grows 1.3% per year for 10 years.

15. A population of 752,000 decreases 1.4% per year for 18 years.

16. A new car that sells for $18,000 depreciates 25% each year for 4 years.

Identify each function as a compression, a reflection, or a translation of the parent function.

6.

$y = 2^x$, $y = 2^{(x-1)}$

7.

$y = 2^x$, $y = 0.75(2^x)$

8.

$y = 2^x$, $y = -2^x$

Write a function for the indicated transformation.

9. the function $y = 5^{(x-2)}$ vertically stretched by the factor 3

10. the function $y = 7 \cdot 2^x$ translated up 8 units

For each function, identify the transformation from the parent function $y = b^x$.

11. $y = 2^{(x-4)}$

12. $y = 20\left(\frac{1}{2}\right)^x + 10$

13. $y = 4^{(x+2)}$

14. $y = 5(0.25)^x + 5$

15. $y = -2(3)^x$

16. $y = \frac{1}{2}(9)^x$

17. $y = 5^x + 3$