

Simplify each expression. Use positive exponents.

1. $\frac{4x^{-2}}{y^{-8}}$

2. $\frac{1}{p^2q^{-4}r^0}$

1. _____

2. _____

Evaluate each function for x = -1, 1, 2

3. $f(x) = 3 \cdot 2^x$

4. $f(x) = 40 \cdot \left(\frac{1}{2}\right)^x$

3. _____

4. _____

5. If $z = \frac{1}{4}$, which expression has the greatest value?

a. $z^{-6}z^4$

b. $(z^{-2}z^5)^{-2}$

c. $(z^3)^5$

d. $-(z^2z^{-4})^{-3}$

5. Circle one: a b c d

Find the solution to each exponential equation.

6. $4^{-x+2} = \frac{1}{1024}$

7. $5 - 2^{x-4} = -507$

6. _____

7. _____

8. $3^{2x+1} = 243$

9. $6 - 6^x = -1290$

8. _____

9. _____

10. A population of 175 bears decreases at an annual rate of 2.5%. How many bears will there be in 6 years?

10. _____

11. A geometric sequence has an initial value of 32 and a common ratio of 0.2, Write a function to represent this sequence.

11. _____

Determine whether the following sequences are Arithmetic or Geometric. If the Sequence is geometric, identify the common ratio and write the explicit and recursive formulas.

12. 100, 20, 4, 0.8, ...

12. _____

Explicit _____

Recursive _____

13. 20, 60, 180, 540, ...

13. _____

Explicit _____

Recursive _____

14. 4, 8, 12, 16, ...

14. _____

Explicit _____

Recursive _____

15. 5, 2.5, 1.25, 0.625, ...

15. _____

Explicit _____

Recursive _____

In the following problems, combine the given functions and simplify.

$f(x) = 9x - 3$

$g(x) = 3x$

15. $(g - f)(x)$

16. $(f \cdot g)(x)$

17. $(g + f)(x)$

16. _____

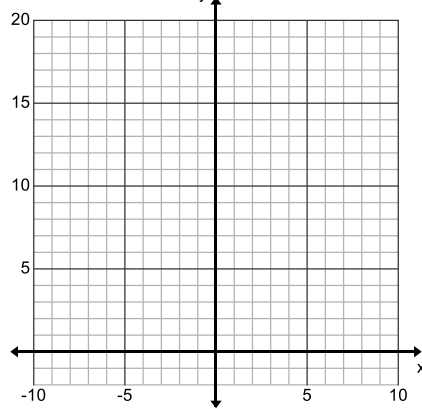
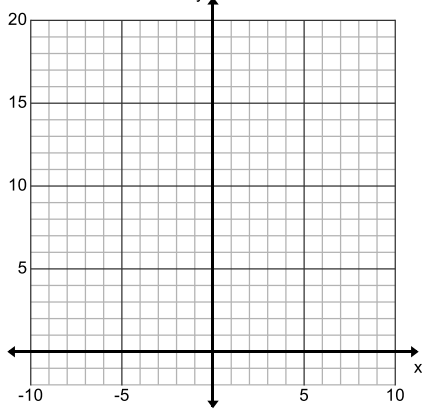
17. _____

18. _____

Graph each function.

19. $f(x) = \frac{1}{2} \cdot 3^x$

20. $y = 0.5 \left(\frac{1}{2}\right)^x$



21. Reasoning: Which of the following exponential decay equations will decrease below 25 first? Explain.

$y_1 = 85 (0.32)^x$

$y_2 = 42 (0.8)^x$

20. Circle one: y_1 or y_2

Explain: _____
