Secondary Math 2 Name_____

Unit 8 Functions Review

Date_____ Period____

Transform the given function $f(x)$ as described and write the resulting function as an equation.

1) $f(x) = |x|$
expand vertically by a factor of 3
reflect across the x-axis
translate right 2 units
translate up 3 units

2) $f(x) = x^2$
compress vertically by a factor of 2
reflect across the x-axis
translate left 2 units
translate up 2 units

3) $f(x) = |x|$
compress vertically by a factor of 2
reflect across the x-axis
translate left 3 units
translate up 2 units

Describe the transformations necessary to transform the graph of $f(x)$ into that of $g(x)$.

4) $f(x) = x^2$
$g(x) = -3(x+2)^2 - 2$

5) $f(x) = |x|$
$g(x) = -\frac{1}{2} \cdot |x+2| - 3$

6) $f(x) = x^2$
$g(x) = -\frac{1}{3}(x+1)^2 - 3$

For each problem, find the average rate of change of the function over the given interval.

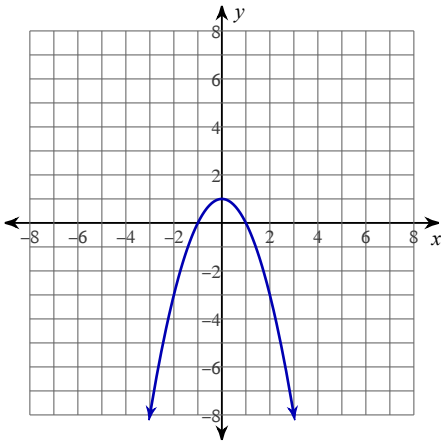
7) $f(x) = -x^2 + 1;\quad [-2, 1]$

8) $f(x) = 2x^2 + 2x + 2;\quad [-2, -\frac{5}{3}]$

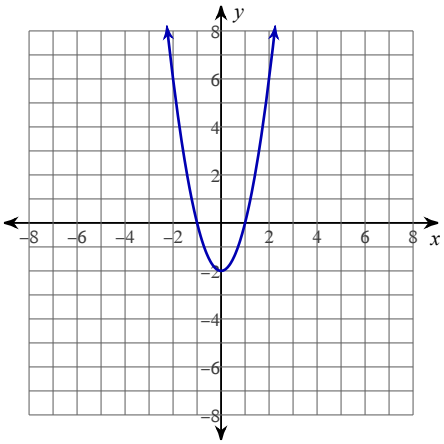
9) $y = -2|x - 3| - 1;\quad [-1, 4]$

10) $y = \frac{1}{2} \cdot 4^x;\quad [2, 4]$

11) $y = -x^2 + 1;\quad [-1, 0]$



12) $y = 2x^2 - 2;\quad [0, 2]$



Use the information to answer the question.

13) A savings account starts with $1,500. It gains 2.5% interest each month. How much is in the account after one year?

14) A radioactive substance decays by 10% each year. If there was originally 50 grams of the substance, how much would be left after 5 years?

Identify the initial value, growth or decay factor, and growth or decay rate.

15) $y = 12 \cdot 0.87^{x}$

16) $y = 35 \cdot 1.14^{x}$

17) $y = 140 \cdot 0.86^{x}$

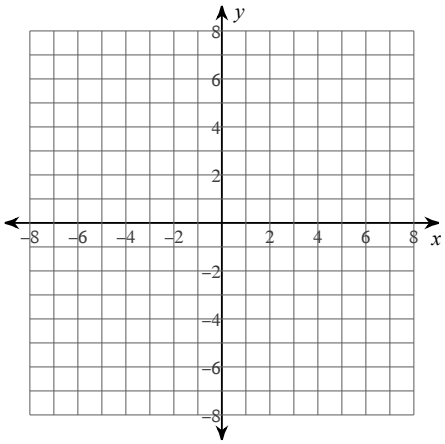
18) $y = 25 \cdot 0.93^{4x}$

19) $y = 1.07^{3x}$

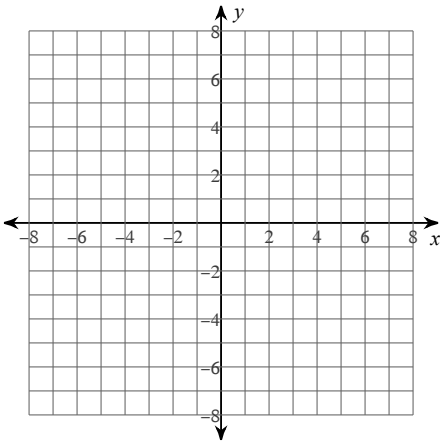
20) $y = 500 \cdot 1.02^{5x}$

Sketch the graph of each function.

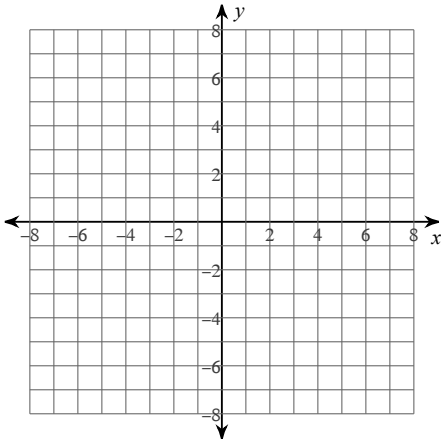
21) $g(x) = \begin{cases} 2|x|, & x \le 3 \\ (x-3)^2, & x > 3 \end{cases}$



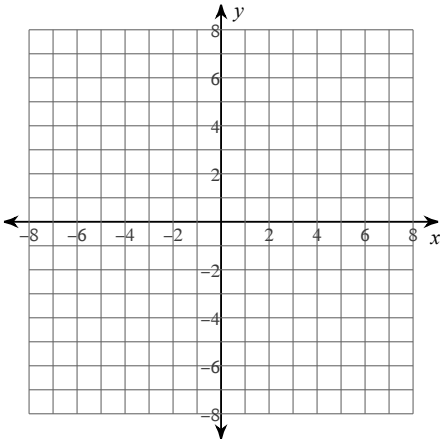
22) $g(x) = \begin{cases} (x-2)^2, & x < 2 \\ -|x|, & x \ge 2 \end{cases}$



23) $g(x) = \begin{cases} -|x|, & x < -4 \\ 1, & -4 \le x \le 2 \\ -4, & x > 2 \end{cases}$

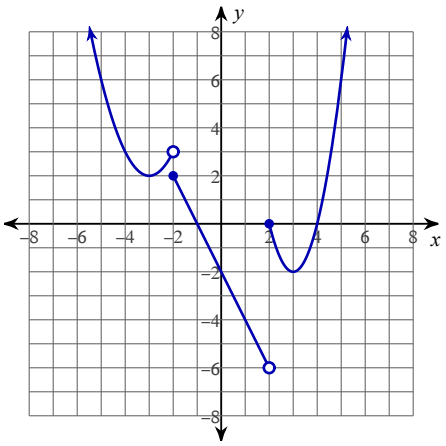


24) $g(x) = \begin{cases} 3, & x < -4 \\ |x| - 3, & -4 \le x \le 2 \\ -x + 2, & x > 2 \end{cases}$

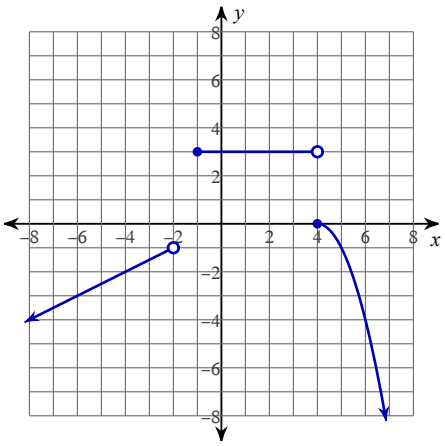


Write an equation for each piecewise function.

25)

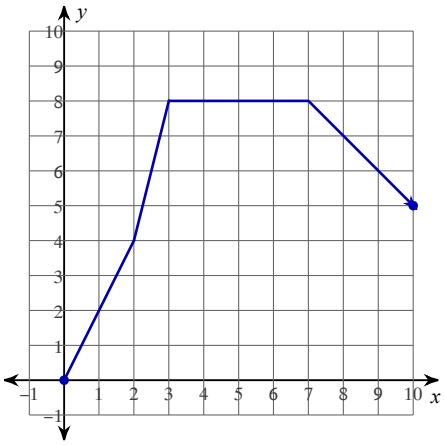


26)



Write a scenario that can be modeled by the graph.

27)



Determine if each situation represents linear, quadratic, exponential, or none.

28) A salary scale starts at $45,000 plus 10% commission for every sale.

29) $\{(-1, 4), (0, 8), (2, 32), (4, 128)\}$

30) $\{(-4, -2), (-2, 8), (-1, -3), (0, 12)\}$

31) $\{(-2, 16), (-1, 7), (0, 0), (1, -5), (2, -8)\}$

32) A radioactive substance decays by 50% every 12 years.