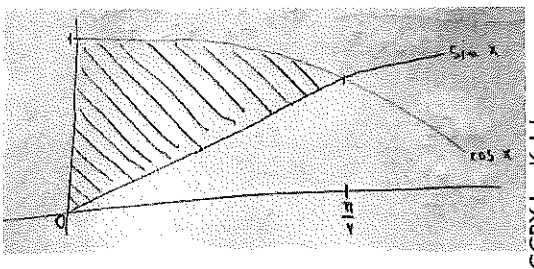
# 3.6 Interpreting Functions

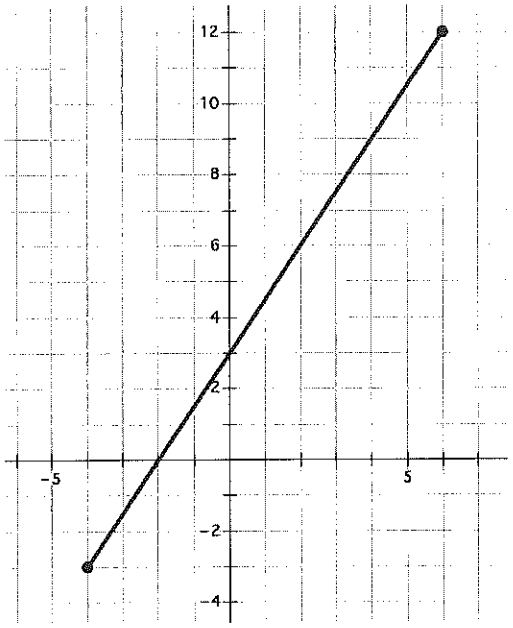
## *A Practice Understanding Task*



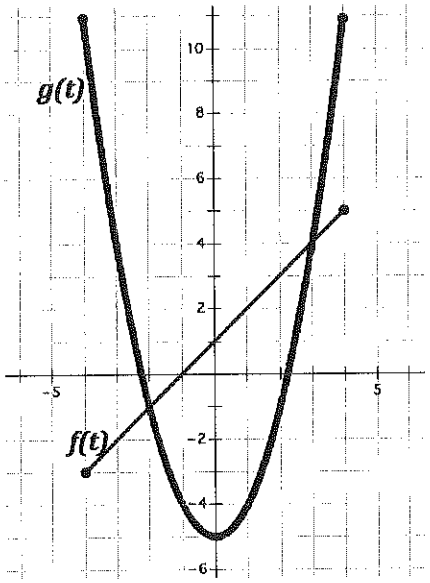



Given the graph of $f(x)$, answer the following questions. Unless otherwise specified, restrict the domain of the function to what you see in the graph below. Approximations are appropriate answers.

1. What is $f(2)$?
2. For what values, if any, does $f(x) = 3$?
3. What is the x-intercept?
4. What is the domain of $f(x)$?
5. On what intervals is $f(x) > 0$?
6. On what intervals is $f(x)$ increasing?
7. On what intervals is $f(x)$ decreasing?
8. For what values, if any, is $f(x) > 3$?



Consider the linear graph of $f(t)$ and the nonlinear graph of $g(t)$ to answer questions 9-14. Approximations are appropriate answers.




9. Where is $f(t) = g(t)$?

10. Where is $f(t) > g(t)$ ?

11. What is $f(0) + g(0)$ ?

12. What is $f(-1) + g(-1)$ ?

13. Which is greater: $f(0)$ or $g(-3)$?

14. Graph: $f(t) + g(t)$ from [-1, 3]

The following table of values represents two continuous functions, $f(x)$ and $g(x)$. Use the table to answer the following questions:

| x | f(x) | g(x) |
|---|---|---|
| -5 | 44 | -13 |
| -4 | 30 | -9 |
| -3 | 20 | -5 |
| -2 | 12 | -1 |
| -1 | 6 | 3 |
| 0 | 2 | 7 |
| 1 | 0 | 11 |
| 2 | 0 | 15 |
| 3 | 2 | 19 |
| 4 | 6 | 23 |
| 5 | 12 | 27 |
| 6 | 20 | 31 |

15. What is $g(-3)$?

16. For what value(s) is $f(x) = 0$?

17. For what values does $f(x)$ seem to be increasing?

18. On what interval is $g(x) > f(x)$

19. Which function is changing faster in the interval [-5, -1]? Why?

Use the following relationships to answer the questions below.

$h(x) = 2^x$ $f(x) = 3x - 2$ $g(x) = 8$ $x = 4$ $y = 5x + 1$

20. Which of the above relations are functions? Explain.

21. Find *f(2), g(2), and h(2).*

22. Write the equation for *g(x) + h(x).*

23. Where is *g(x)< h(x)* ?

24. Where is *f(x)* increasing?

25. Which of the above functions has the fastest growth rate?

Create a graph for each of the following functions, using the given conditions

26. This function has the following features: *f(2)* is positive; *f(-2) = 0, f(x) is always Increasing and has a domain of All Real Numbers.*

27. This function has the following features: *f(3)> f(6); f(1) = 0; f(2) = 4; f(x) is increasing from [-5, 3); has a domain from [-5, 10]*

28. This function has the following features: *f(x) has a constant rate of change; f(5) = 0*

29. Create your own conditions- have at least three and then create examples where the solution could be different graphs.

# 3.6

READY, SET, GO! Name Period Date

## READY

Topic: Solving Systems by Substitution

**In prior work the meaning of $f(x) = g(x)$ was discussed. This means to find the point where the two equations are equal and where the two graphs intersect. It is possible to find the point of intersection algebraically instead of graphing the two lines. Since $f(x) = g(x)$, it's possible to set each equation equal to the other and solve for x.**

**Example:** Find the point of intersection of function $f(x) = 3x + 4$ and function $g(x) = 4x + 1$.

Since, $f(x) = g(x)$, *let* $3x + 4 = 4x + 1$. Then solve for $x$.

$$\begin{array}{r} 3x + 4 = 4x + 1 \\ -3x - 1 = -3x - 1 \\ \hline 0x + 3 = 1x + 0 \\ 3 = 1x \end{array}$$

Subtract $3x$ and 1 from both sides of the equation.

Now let x = 3 in each equation to find $f(x)$ *and* $g(x)$ *when* $x = 3$.
$f(3) = 3(3) + 4 \rightarrow 9 + 4 = 13$ *and* $g(3) = 4(3) + 1 \rightarrow 12 + 1 = 13$

When $x = 3, f(3)$ *and* $g(3)$ *both equal* 13. *The point of intersection is* $(3, 13)$.

**Find the point of intersection for $f(x)$ and $g(x)$ using the algebraic method in the example above.**

1. $f(x) = -5x + 12$ and $g(x) = -2x - 3$

2. $f(x) = \frac{1}{2}x + 2$ and $g(x) = 2x - 7$

3. $f(x) = -\frac{2}{3}x + 5$ and $g(x) = -x + 7$

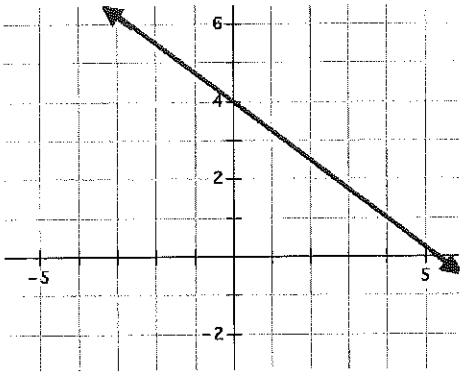
4. $f(x) = x - 6$ and $g(x) = -x - 6$

## *SET*

Topic: Describing attributes of a functions based on graphical representation

Use the graph of each function provided to find the indicated values.

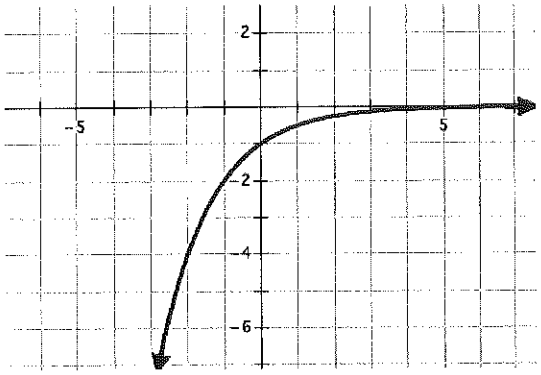
5. $f(x)$




a. $f(4) =$ _____ b. $f(-4) =$ _____

c. $f(x) = 4$, $x =$ _____ d. $f(x) = 7$, $x =$ _____

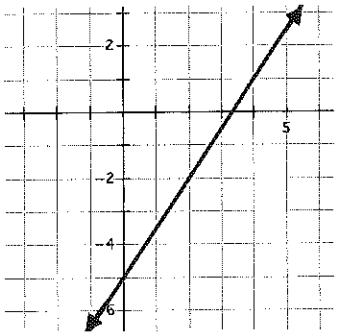
6. $g(x)$




a. $g(-1) =$ _____ b. $g(-3) =$ _____

c. $g(x) = -4$ $x =$ _____ d. $g(x) = -1$, $x =$ _____

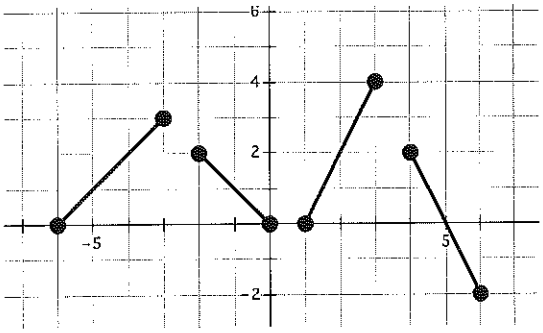
7. $h(x)$




a. $h(0) =$ _____ b. $h(3) =$ _____

c. $h(x) = 1$, $x =$ _____ d. $h(x) = -2$, $x =$ _____

8. $d(x)$




a. $d(-5) =$ _____ b. $d(4) =$ _____

c. $d(x) = 4$, $x =$ _____ d. $d(x) = 0$, $x =$ _____

**For each situation either create a function or use the given function to find and interpret solutions.**

9. Fran collected data on the number of feet she could walk each second and wrote the following rule to model her walking rate $d(t) = 4t$.

a. What is Fran looking for if she writes $d(12) =$ _____?

b. In this situation what does $d(t) = 100$ tell you?

c. How can the function rule be used to indicate a time of 16 seconds was walked?

d. How can the function rule be used to indicate that a distance of 200 feet was walked?

10.Mr. Multbank has developed a population growth model for the rodents in the field by his house. He believes that starting each spring the population can be modeled based on the number of weeks with the function $p(t) = 8(2^t)$.

Find $p(t) = 128$. Find $p(4)$. Find $p(10)$.

d. Find the number of weeks it will take for the population to be over 20,000.

e. In a year with 16 weeks of summer, how many rodents would he expect by the end of the summer using Mr. Multbank's model?

What are some factors that could change the actual result from your estimate?

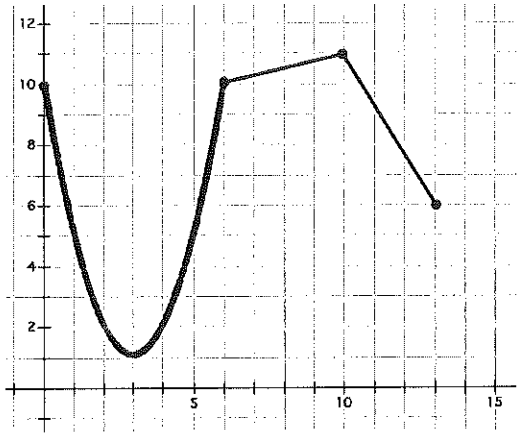
# 3.6

## GO

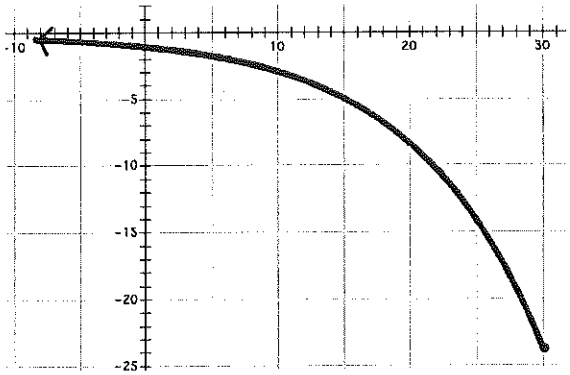
Topic: Describe features of functions from the graphical representation.

For each graph given provide a description of the function. Be sure to consider the following: decreasing/increasing, min/max, domain/range, etc.

11. Description of function:




12. Description of function:




13. Description of function: