

1. Evaluate the following expressions given the functions below:  
Show your substitutions (the expression with the variable replaced by a number).

REMEMBER\*\*\*  
f(-3) means -3 is your input and you plug it in for x  
  
f(x) = -3 means that your whole function is = to -3 and you plug into the y.

$g(x) = -3x + 1$        $f(x) = x^2 + 7$        $h(x) = \frac{12}{x}$        $j(x) = 2x + 9$

a.  $g(10) =$  \_\_\_\_\_ e.  $h(a)$  \_\_\_\_\_

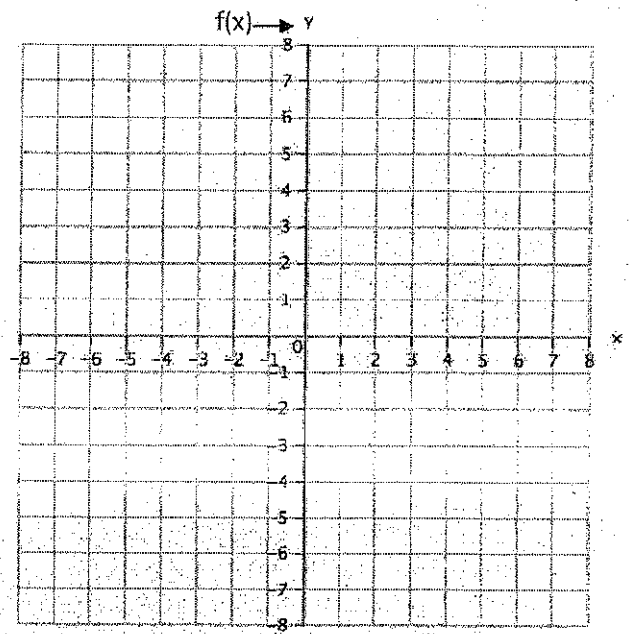
b.  $f(3) =$  \_\_\_\_\_ f. Find x if  $g(x) = 16$  \_\_\_\_\_

c.  $h(-2) =$  \_\_\_\_\_ g. Find x if  $h(x) = -2$  \_\_\_\_\_

d.  $j(7) =$  \_\_\_\_\_ h. Find x if  $f(x) = 23$  \_\_\_\_\_

2. Translate the following statements into coordinate points and graph:

- a.  $f(-1) = 1$       (\_\_\_\_,\_\_\_\_)      ex ( x, f(x) )
- b.  $f(2) = 7$       (\_\_\_\_,\_\_\_\_)
- c.  $f(1) = -1$       (\_\_\_\_,\_\_\_\_)
- d.  $f(3) = -5$       (\_\_\_\_,\_\_\_\_)
- e.  $f(4) = 2$       (\_\_\_\_,\_\_\_\_)



3. Given this graph of the function  $f(x)$ :

Find:

a.  $f(-4) =$  \_\_\_\_\_

e.  $f(5) =$  \_\_\_\_\_

b.  $f(0) =$  \_\_\_\_\_

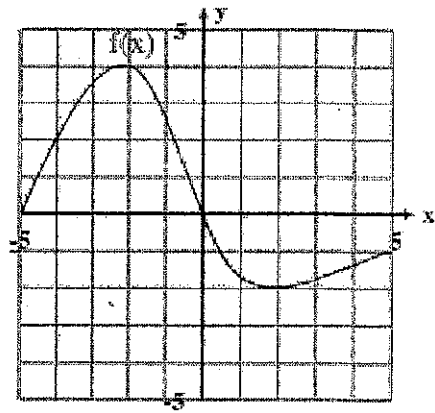
f.  $f(4) =$  \_\_\_\_\_

c.  $f(2) =$  \_\_\_\_\_

g.  $f(-5) =$  \_\_\_\_\_

d.  $f(-2) =$  \_\_\_\_\_

h.  $f(-1) =$  \_\_\_\_\_



# Functional Function: F of x it is!

**Functional notation** is a way of representing functions algebraically. Function notation makes it easier to recognize the independent and dependent variables in an equation.

The function  $f(x)$  is read as “ $f$  of  $x$ ” and indicates that  $x$  is the independent variable. Consider the equation  $c = 8s + 15$ , where the independent variable  $s$  represents the number of shirts ordered and the dependent variable  $c$  represents the cost of the order. The equation can be written using functional notation as  $f(s) = 8s + 15$ . The cost, defined by  $f$ , is a function of  $s$ , the number of shirts ordered.

The process of calculating the value of a function for a specific value of the independent variable is called **evaluating a function**.

For example, the cost of ordering 4 shirts can be calculated by evaluating the function at  $s = 4$ .

This is written as  $f(4)$  and read as “ $f$  of 4.”

To evaluate, substitute 4 for  $s$  in the rule  $f(s) = 8s + 15$ .

$$f(4) = 8(4) + 15 = 32 + 15 = 47$$

$$f(4) = 47$$

## Problem 1 Functions as Equations

1. The function  $f(s) = 8s + 15$  represents the cost of ordering  $s$  shirts. What are the domain and range of the function?

2. Use the equation  $f(s) = 8s + 15$  to evaluate the function at each value. Explain what each means in terms of the problem.

a.  $f(7)$

b.  $f(100)$

c.  $f(11)$

d.  $f(0)$

e.  $f(2.5)$

3. Calculate the value of  $x$  that makes each equation true. Explain what each means in terms of the problem.

a.  $f(x) = 55$

b.  $f(x) = 175$

c.  $f(x) = 151$

REMEMBER\*\*\*

$f(-3)$  means -3 is your input and you plug it in for  $x$

$f(x) = -3$  means that your whole function is = to -3 and you plug into the  $y$ .

## Problem 2 Functions as Tables

The function  $h(a)$  represents the average height of boys that are  $a$  years old.

Boy's Age	Average Height in Inches
6 months	26
12 months	30
18 months	34
2 years	36
3 years	39
4 years	42
5 years	44
6 years	47
7 years	49
8 years	51
9 years	53
10 years	55
11 years	57
12 years	59
13 years	61

1. Use the table to evaluate the function at each value. Explain what each means in terms of the problem.

a.  $h(7)$

b.  $h(1.5)$

c.  $h(11)$

d.  $h(12.5)$

2. Calculate the value of  $a$  that makes each equation true. Explain what each means in terms of the problem.

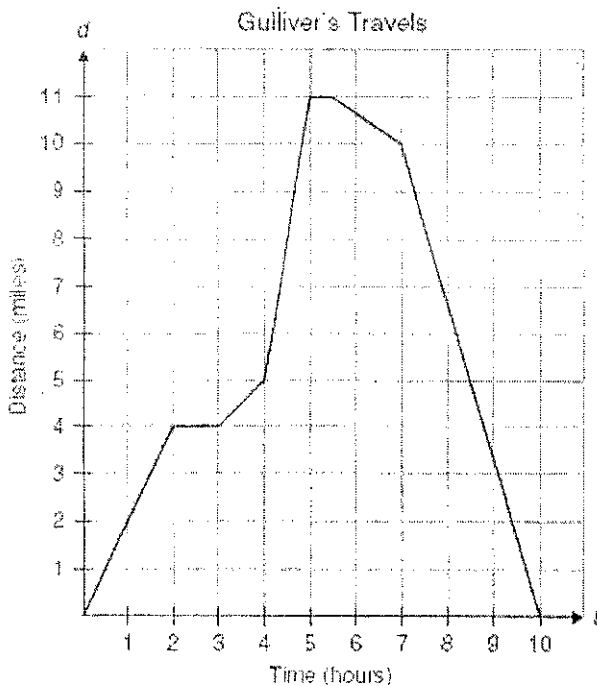
a.  $h(a) = 61$

b.  $h(a) = 36$

c.  $h(a) = 53$

d.  $h(a) = 45$

## Problem 3 Functions as Graphs



The function  $d(t)$  represents Gulliver's distance from home after  $t$  hours.

1. Use the graph to evaluate the function at each value. Explain what each means in terms of the problem.

a.  $d(2)$

b.  $d(5)$

c.  $d(2.9)$

d.  $d(10)$

2. Calculate the value of  $t$  that makes each equation true. Explain what each means in terms the problem.

a.  $d(t) = 2$

b.  $d(t) = 5$

c.  $d(t) = 4$

d.  $d(t) = 0$