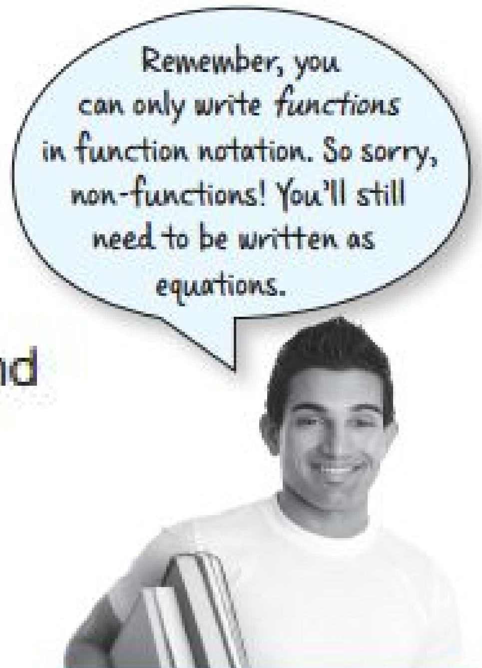
Chapter 2 Introduction

Practice with Evaluating and Solving Equations/Functions

PROBLEM 1 A New Way to Write Something Familiar

Functions can be represented in a number of ways. An equation representing a function can be written using *function notation*. **Function notation** is a way of representing functions algebraically. This form allows you to more efficiently identify the independent and dependent quantities. The function $f(x)$ is read as "f of x" and indicates that x is the independent variable.



Let's look at the relationship between an equation and function notation.

Consider orders for a custom T-shirt shop. U.S. Shirts charges $8 per shirt plus a one-time charge of $15 to set a T-shirt design. The equation $y = 8x + 15$ can be written to model this situation. The independent variable x represents the number of shirts ordered, and the dependent variable y represents the total cost of the order, in dollars.

You know this is a function because for each number of shirts ordered (independent value) there is exactly one total cost (dependent value) associated with it.

Because this situation is a function, you can write $y = 8x + 15$ in function notation.

$$f(x) = 8x + 15$$

The cost, defined by f, is a function of x, the number of shirts ordered.

A common way to name a function is $f(x)$. However, you can choose any variable to name a function. You could write the T-shirt cost function as $C(s) = 8s + 15$, where the cost, defined as C, is a function of s, the number of shirts ordered.

You can use any two letters to write or name a function!!!!!

Problem Set

Rewrite each function using function notation.

1. Rewrite the function $y = 3x - 8$ using function notation so that the dependent quantity, defined as f, is a function of the independent quantity x.

   $f(x) = 3x - 8$

2. Rewrite the function $y = 3x^2 + 6x - 1$ using function notation so that the dependent quantity, defined as C, is a function of the independent quantity x.

   $C(x) = 3x^2 + 6x - 1$

3. Rewrite the function $y = 3^x + 8$ using function notation so that the dependent quantity, defined as P, is a function of the independent quantity x.

   $P(x) = 3^x + 8$

4. Rewrite the function $l = |n - 2|$ using function notation so that the dependent quantity, defined as L, is a function of the independent quantity n.

   $L(n) = |n - 2|$

5. Rewrite the function $d = -\frac{1}{2}m + 5$ using function notation so that the dependent quantity, defined as A, is a function of the independent quantity m.

   $A(m) = -\frac{1}{2}m + 5$

Evaluate each of the following.

1. $2a + 4$ when $a = 5$

   14

2. $3w - 2$ when $w = -8$

   -26

3. $f(x) = 4x + 9$ when $x = 2$

   17

4. $f(x) = 2x - 4$ when $x = -1$

   -6

Solve each equation.

1. $x - 4 = -9$

X= -5

2. $\dfrac{n}{6} = 5$

X= 30

3. $5c = -15$

X= -3

4. $6a + 2 = -4$

X= -1

5. $\dfrac{r}{4} + 3 = 9$

X= 24

6. $3(k + 8) = 21$

X= -1

Substitute and <u>solve for x</u> in each of the following.

1. $f(x) = x - 4 \quad when \; f(x) = 10$

X= 14

2. $f(x) = 2x + 28 \quad when \; f(x) = 328$

X= 150

3. $f(x) = 4x - 10 \quad when \; f(x) = 86$

X= 24

4. $f(x) = x + 4 \quad when \; f(x) = 2x - 8$

X= 12