

## Core Focus: Problem Solving with Equations

### Pages 71–73

- (a) Let  $p$  represent the list price of the book.

(b)  $p - 5 = p - 0.2p$ ; The price of the book at Bookstore A is  $p - 5$ . The price of the book at Bookstore B is  $p - 0.2p$ , where  $0.2p$  represents 20% of the book's selling price.

(c)  $p - 5 = p - 0.2p$ ;  $p - 5 = 0.8p$ ;  
 $p - 0.8p - 5 = 0.8p - 0.8p$ ;  
 $0.2p - 5 = 0$ ;  $0.2p - 5 + 5 = 0 + 5$ ;  
 $0.2p = 5$ ;  $\frac{0.2p}{0.2} = \frac{5}{0.2}$ ;  $p = 25$

(d) The list price of the book is \$25.
- (a) Let  $r$  represent the amount of rainfall in Smallville during 2010. The amount of rainfall in 2011 can be expressed in two ways. The first way is  $r + 5.5$  and the second way is  $r + 0.22r$ , where  $0.22r$  represents 22% of the rainfall in 2010.

(b)  $r + 5.5 = r + 0.22r$

(c)  $r + 5.5 = r + 0.22r$ ;  $r + 5.5 = 1.22r$ ;  
 $r - 1.22r + 5.5 = 1.22r - 1.22r$ ;  
 $-0.22r + 5.5 = 0$ ;  $-0.22r + 5.5 - 5.5 = 0 - 5.5$ ;  
 $-0.22r = -5.5$ ;  $\frac{-0.22r}{-0.22} = \frac{-5.5}{-0.22}$ ;  $r = 25$

(d) The amount of rainfall in Smallville in 2010 was 25 in. The question also asks how much rain fell in Smallville in 2011. The expression  $r + 5.5$  represents the amount of rainfall in Smallville in 2011. Substitute 25 for  $r$  and simplify:  
 $r + 5.5 = 25 + 5.5 = 30.5$ . The amount of rainfall in Smallville in 2011 was 30.5 in.
- (a) Let  $t$  represent the number of trips that Michael makes. Since John makes 2 fewer trips,  $t - 2$  represents the number of trips John makes.

(b)  $2t = 4(t - 2)$

(c)  $2t = 4(t - 2)$ ;  $2t = 4t - 8$ ;  $2t - 4t = 4t - 4t - 8$ ;  
 $-2t = -8$ ;  $\frac{-2t}{-2} = \frac{-8}{-2}$ ;  $t = 4$

(d) Since Michael makes 4 trips while carrying 2 boxes per trip, he carries a total of  $4 \cdot 2 = 8$  boxes. John makes 2 fewer trips than Michael, which means he makes  $4 - 2 = 2$  trips. Since John makes 2 trips while carrying 4 boxes per trip, he carries  $2 \cdot 4 = 8$  boxes.
- (a) Let  $c$  represent the number of cups of sugar in a bag that has a mass of 1.41 kg. Since the empty bags weigh 0.01 kg apiece and 1 cup of sugar and the bag weigh 0.21 kg, the weight of 1 cup of sugar is  $0.21 - 0.01$  or 0.2 kg.

(b)  $0.2c + 0.01 = 1.41$

(c)  $0.2c + 0.01 = 1.41$ ;  
 $0.2c + 0.01 - 0.01 = 1.41 - 0.01$ ;  
 $0.2c = 1.4$ ;  $\frac{0.2c}{0.2} = \frac{1.4}{0.2}$ ;  $c = 7$

(d) There are 7 cups of sugar in a bag that has a mass of 1.41 kg.