Section 8.3

Solving Equations of the forms

$$a(x+b) = c \qquad \frac{x+b}{a} = c$$

Modeling and Problem Solving

Recall:

Step 1: Choose a variable and write a "Let.." statement to say what the variable represents.

Step 2: Create the equation that models the given situation.

$$a(x + b) = c \qquad\qquad \frac{x + b}{a} = c$$

Step 3: Solve the equation you created.

Step 4: Answer with a concluding sentence.

The formula for calculating the **mean** (*average*) of two numbers:

$$\frac{a+b}{2}$$

add them together and divide by 2

Example #1

$$\text{mean} = \frac{a+b}{2}$$

The mean of two numbers is 7.3
One of the numbers is 19.5
What is the other number?

Let x = the other number

Equation: $(2)(7.3) = \left(\dfrac{19.5+x}{2}\right)(2)$

$$14.6 = 19.5 + x$$
$$-19.5 \qquad\quad -19.5$$
$$-4.9 = x$$

The other number is 14.9

Example #2

On a typical day in October in Churchill, MB, the daily average temperature is -1.5°C. The high temperature is 1.3°C. What is the low temperature?

Let L = low temperature

mean $= \dfrac{hi + lo}{2}$

Equation: $2(-1.5) = \left(\dfrac{1.3 + L}{2}\right)2$

$-3 = 1.3 + L$

$-1.3 \quad -1.3$

$-4.3 = L$

The low temperature was $-4.3°C$.

Example #3

$4n + 7.5$

$4n$

When the sum of 4 times a number and 7.5 is multiplied by -3, you get -184.5
What is the number?

Let n = the unknown number

Equation: $\dfrac{-3(4n + 7.5)}{-3} = \dfrac{-184.5}{-3}$

$4n + 7.5 = 61.5$

$-7.5 -7.5$

The unknown
number is 13.5

$\dfrac{4n}{4} = \dfrac{54}{4}$

$n = 13.5$

Example #4

Valerie bought five packages of golf balls on sale for $29.50. Each package had a discount of $2.75. What was the regular price for a package of golf balls?
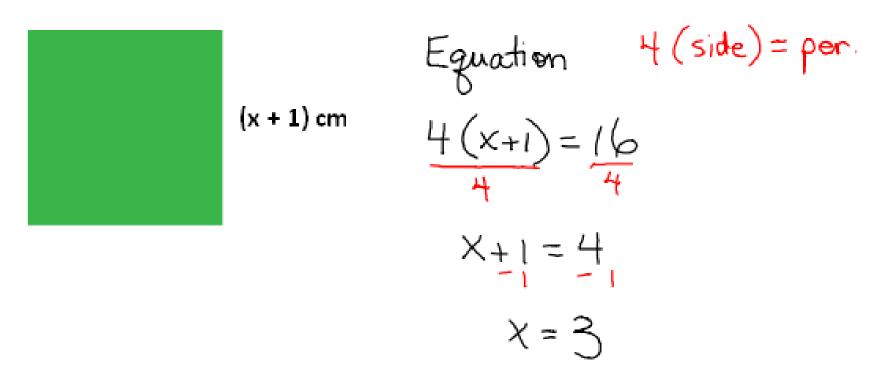
Let p = regular price for a package of golf balls

Equation: $$\frac{5(p-2.75)}{5} = \frac{29.50}{5}$$

$$p - 2.75 = 5.90$$
$$+2.75 \quad +2.75$$
$$p = 8.65$$

The regular price of the golf balls is $8.65

Example #5

The perimeter of this square is 16 cm. Determine the value of x.

(x + 1) cm

Equation   4 (side) = per.

$$\frac{4(x+1)}{4} = \frac{16}{4}$$

$$x + 1 = 4$$
$$-1 \quad -1$$

$$x = 3$$

Check your understanding questions:

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#12, 14, 15, 16, 17, 18, 22