Lesson 2-5
Exploring Two-Step Equations

...rm-Up: Solve the equations below.

b. $\frac{y}{3} = -2 \cdot 3$

$y = -6$

$x + (+5) = 18$

$x + 5 = 18$

$-5 \quad -5$

$x = 13$

$m + 2 = -16$

$-2 \quad -2$

$m = -18$

Review:

John had a bag of chips. He ate 23 chips and now there are 48 left. How many chips were in the bag at the start?

C = # of chips

Write an equation: $C - 23 = 48$

Solve: $C = 71$

Angela is three years older than Simon. If Angela is 12, how old is Simon?

S = Simon's age

Write an equation: $S + 3 = 12$

$-3 \quad -3$

$0 \quad 9$

Solve: $S = 9$

Think About It...

Five years more than three times your age. a = age

$3a + 5$

Seven centimeters less than twice the span of your hand. h = hand span

$2h - 7$

10 people fewer than half the population of your town. p = population

$\frac{P}{2} - 10$ or $\frac{1}{2}p - 10$

Writing Two-Step Equations

Example:

On weekday afternoons, a local bowling alley offers a special. Each bowling game costs $2.50, and shoe rental is $1.25. Write an expression for the total cost of the games you play, including shoe rental. Then evaluate your expression for five games.

Step 1: Define the variable. → g = the number of games

Step 2: Write an equation. → $\$2.50 \cdot g + \$1.25$

Step 3: Simplify. → $2.50g + 1.25$

Step 4: Solve. → If g = 5 and $2.50g + 1.25$

$= 2.50(5) + 1.25$

= 12.50 + 1.25

= $13.75

You Try!

Art supplies cost $.79 for each color marker and $1.25 for one poster board. Write an expression for the total cost of supplies, including the markers you buy and one poster board. Then evaluate your expression for seven markers.

Step 1: Define the variable. → m = # of markers

Step 2: Write an equation. → $0.79 \cdot m + 1.25$

Step 3: Simplify. → $0.79m + 1.25$

Step 4: Solve. → $0.79(7) + 1.25$

$5.53 + 1.25 = \$6.78$

You Try!

anie sold half of her comic books and then bought 8 more. Write an equation, then solve the equation to determine how many comic books she has now, if she started with 16 comic books.

b = comic books

b = 16

$\frac{b}{2} + 8 = \frac{16}{2} + 8 = 8 + 8 = \boxed{16}$

Suppose you buy a jumbo lemonade for $2.00 and divide the cost of a pizza with two friends. Write an equation, then solve the equation to find the amount of money you would pay if a pizza cost $9.00.

P = cost of pizza

$\$2 + \frac{P}{3} = 2 + \frac{9}{3} = 2 + 3 = \boxed{\$5}$

Solve these using mental math.

Solve $5g + 8 = 48$ by using number sense.

$\boxed{g = 8}$

Solve $3m + 9 = 21$ using number sense.

$\boxed{m = 4}$

Solve $8d + 5 = 45$ using number sense.

$\boxed{d = 5}$

Solve $4y - 11 = 33$ using number sense.

$\boxed{Y = 11}$