

DO NOW

Two angles are supplementary. The larger angle measures 120 more than the smaller. Find the degree measure of each angle. (Solve using 2 variables.)

let x = larger \angle
 y = smaller \angle

$$x + y = 180$$

$$x = y + 120$$

$$x = y + 120$$

$$x = 30 + 120$$

$$x = 150$$

$$(y + 120) + y = 180$$

$$y + 120 + y = 180$$

$$y + y = 180 - 120$$

$$2y = 60$$

$$y = \frac{60}{2}$$

$$y = 30$$

The smaller angle is 30° .
 The larger angle is 150° .

5.3 Using Systems of Equations to Solve Word Problems - Day 2

Perimeter problems: use formulas

$$P_{\square} = 2l + 2w$$

Value Problems: Value of vs # of

In general \rightarrow one equation is # of
 the other is value of

Remember:

2 variables and 2 equations

- The length of a rectangle is 3 less than twice the width. The perimeter of the rectangle is 42. Find the length and the width.

let x = length
 y = width

$$x = 2y - 3$$

$$2x + 2y = 42$$

$$\begin{array}{|c|} \hline P=42 \\ \hline \end{array} \begin{array}{l} y \\ x \end{array}$$

$$2x + 2y = P$$

$$2(2y - 3) + 2y = 42$$

$$4y - 6 + 2y = 42$$

$$4y + 2y = 42 + 6$$

$$6y = 48$$

$$y = \frac{48}{6}$$

$$y = 8$$

$$x = 2y - 3$$

$$x = 2(8) - 3$$

$$x = 16 - 3$$

$$x = 13$$

length = 13
 width = 8

- A soda machine contains 20 coins; some are nickels and the rest are quarters. If the value of the coins is \$4.40, find the number of coins of each type.

let x = # of nickels (0.05)

y = # of quarters (0.25)

$$\# \text{ of} \rightarrow x + y = 20 \xrightarrow{\times -5} -5x - 5y = -100$$

$$\text{value of} \rightarrow .05x + .25y = 4.40 \xrightarrow{\times 100} 5x + 25y = 440$$

$$x + y = 20$$

$$x + 17 = 20$$

$$x = 20 - 17$$

$$x = 3$$

$$20y = 340$$

$$y = \frac{340}{20}$$

$$y = 17$$

$$\text{check: } \begin{array}{r|l} x+y & 20 \\ 3+17 & 20 \\ \hline 20 & 20 \end{array}$$

$$\begin{array}{r|l} .05x+.25y & 4.40 \\ .05(3)+.25(17) & 4.40 \\ .15+4.25 & 4.40 \\ \hline 4.40 & 4.40 \end{array}$$

3 nickels
 17 quarters

- The cost of an adult ticket to a football game was \$1.75. The cost of a student ticket was \$1.25. The number of student tickets sold was twice the number of adult tickets. The total income from the sale of tickets was \$850. How many adults tickets were sold?

let x = # of adult tickets (1.75)

y = # of student tickets (1.25)

$$\# \text{ of} \rightarrow y = 2x$$

$$\text{value of} \rightarrow 1.75x + 1.25y = 850$$

$$1.75x + 1.25(2x) = 850$$

$$1.75x + 2.50x = 850$$

$$4.25x = 850$$

$$x = \frac{850}{4.25}$$

$$x = 200$$

$$\begin{array}{l} y = 2x \\ y = 2(200) \\ y = 400 \end{array}$$

200 adult tickets

- At a fast food restaurant, a family bought 4 hamburgers and 3 bags of french fries for \$4.20. At the same time, a family traveling with them bought 5 hamburgers and 2 bags of french fries for \$4.55. What was the cost of one hamburger and what was the cost of one bag of french fries?

let x = \$ hamburger

y = \$ french fries

$$4x + 3y = 4.20 \xrightarrow{\times -2} -8x - 6y = -8.40$$

$$5x + 2y = 4.55 \xrightarrow{\times 3} 15x + 6y = 13.65$$

$$7x = 5.25$$

$$x = \frac{5.25}{7}$$

$$x = .75$$

$$4x + 3y = 4.20$$

$$4(.75) + 3y = 4.20$$

$$3 + 3y = 4.20$$

$$3y = 4.20 - 3$$

$$3y = 1.20$$

$$y = \frac{1.20}{3}$$

$$y = .40$$

hamburger = \$.75
 fries = \$.40

HOMEWORK

Worksheet - HW Word Problems - Day 2