

Essential Question: How can we model situations and solve problems using equations?

Do Now: Set up an equation to solve the following problem.

Cameron volunteers his time at the local library every week. This week he worked five more than twice the number of hours he worked last week. If he worked 17 hours this week, how many hours did he work last week?

x = hours worked last week

6 hrs

$$2x + 5 = 17$$

$$2x = 12$$

$$x = 6$$

Solving Word Problems Algebraically



Remember to always...

- 1) Read the problem carefully and make sense of the situation. Be able to describe the situation in your own words.
- 2) Define all unknowns (always let x represent what you know the least about).
- 3) Use key words in the problem to set up an equation relating all the unknowns. The equation models the situation symbolically.
- 4) Solve the equation.
- 5) Answer the question and ask yourself..."does my answer make sense?"

1. Dean has \$84 and Mia has \$12. How much money must Dean give to Mia so that Mia will have three times as much as Dean?

x = money Dean gives Mia

\$60

$$3 \cdot \text{Dean} = \text{Mia}$$

$$3(84 - x) = x + 12$$

$$252 - 3x = x + 12$$

$$252 = 4x + 12$$

$$240 = 4x$$

$$60 = x$$

2. The sides of a triangle are in the ratio 4:3:1. If the perimeter of the triangle is 72 cm, find the length of each side of the triangle.

x = shortest side of Δ

9 cm

$3x$ = third side of Δ

27 cm

$4x$ = longest side of Δ

36 cm

$$x + 3x + 4x = 72$$

$$8x = 72$$

$$x = 9$$

$$3(9) = 27$$

$$4(9) = 36$$

3. Mark wants to make trail mix made up of almonds, peanuts and dried cranberries. He wants to mix one part almonds, two parts peanuts, and three parts cranberries. If he wants to create a trail mix totaling 4 pounds, determine how many pounds of each ingredient he needs.

x = pounds of almonds	$\frac{2}{3}$ lb	$x + 2x + 3x = 4$
$2x$ = pounds of peanuts	$1\frac{1}{3}$ lb	$6x = 4$
$3x$ = pounds of cranberries	2 lb	$x = \frac{2}{3}$
		$2\left(\frac{2}{3}\right) = \frac{4}{3}$
		$3\left(\frac{2}{3}\right) = 2$



Today's Take Away....

- In order to solve problems using equations, first make sense of the situation and define all unknowns in the problem.
- Next, write an equation that relates all the information in the problem and models the scenario.
- After solving the equation, reread the problem and make sure you have answered the question. Always check to make sure your answer is complete, correct and makes sense.

It's Your Turn Now...

Seth has one less than twice the number of compact discs (CDs) that Jason has. Rodney has 53 more CDs than Jason has. If Seth gives Jason 25 CDs, Seth and Jason will have the same number of CDs. How many CDs did each of the three boys have to begin with?

$2x - 1$ = number of CD's Seth has	101
x = number of CD's Jason has	51
$x + 53$ = number of CD's Rodney has	104

$$2x - 1 - 25 = x + 25$$

$$2x - 26 = x + 25$$

$$x - 26 = 25$$

$$x = 51$$