Solving Word Problems Part 2

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Mathematics 9
Equation Solving
Solving Word Problems Part 2

Last class we looked at solving simple number problems. Today we will look at solving for multiple items.

Solving Multi-Item Word Problems

1. Establish what items you are working with or need to find.
2. Write "let" statements for each item. Use a simple variable to represent the item you know the least about. Write the other items in terms of this first one.
3. Use the "let" statements to help create the equation.
4. Solve the equation using correct algebra.
5. Remember to answer the question in a short sentence. Make sure to include the correct units where necessary.

A. Multi-Item Word Problems

1) Kathy has nine more oatmeal cookies than chocolate chip cookies. If she has 39 cookies in total, how many of each type does she have?

let statements: x = number of chocolate chip cookies
$x + 9$ = number of oatmeal cookies.

Equation: $x + x + 9 = 39$

$2x + 9 = 39$
$-9 \quad -9$

$\frac{2x}{2} = \frac{30}{2}$

Solution: $x = 15$

There are 15 chocolate chip cookies and 24 oatmeal cookies
Answer in sentence.

2) Jag has two less than three times as many nickels as dimes. If he has ten coins in total, what is the total value of the money he has?

let statements: x = number of dimes
$3x - 2$ = number of nickels

3 dimes = 30¢
7 nickels = 35¢

Equation: $x + 3x - 2 = 10$

$4x - 2 = 10$
$+2 \quad +2$

$\frac{4x}{4} = \frac{12}{4}$

Solution: $x = 3$

Jag has 65¢
or
Jag has $0.65

3) One number is three times greater than another number. If the smaller plus sixteen is equalled to the larger number plus four, what are the numbers?

$n + 16$ $3n + 4$

let statements:
n = another number (smaller)
$3n$ = one number (larger).

equation
$n + 16 = 3n + 4$
$-3n \quad -3n$
$-2n + 16 = 4$
$-16 \quad -16$
$\frac{-2n}{-2} = \frac{-12}{-2}$

Solution
$n = 6$

The numbers are 6 & 18
answer in sentence

4) Joey is three years older than Jimmy. Three times the sum of their ages is 39. How old is each boy?

$3(x + x + 3) = 39$

let statement:
x = Jimmy's age
$x + 3$ = Joey's age.

equation
$3(x + x + 3) = 39$
$3x + 3x + 9 = 39$
$6x + 9 = 39$
$-9 \quad -9$
$\frac{6x}{6} = \frac{30}{6}$

Solution
$x = 5$

Jimmy is 5 years old and Joey is 8 years old
answer in sentence.

5) The sum of three consecutive odd numbers is 39. What are the numbers?

$x + x + 2 + x + 4 = 39$

3, 5, 7.

let statements
x = first number
$x + 2$ = second number.
$x + 4$ = third number.

equation
$x + x + 2 + x + 4 = 39$
$3x + 6 = 39$
$-6 \quad -6$
$\frac{3x}{3} = \frac{33}{3}$

Solution
$x = 11$

The numbers are 11, 13 & 15
answer in sentence

Assignment: Solving Word Problems Part 2 Assignment

Name:_____

Solving Word Problems Part 2 Assignment

Solve the following. Make sure to include let statements, equation, solution and answer in sentence.

1. Two times a number decreased by seven is (-25). What is the number?

2. Mary is three years older than Molly? If you add their ages together the result is 33. How old is each girl?

3. One number is six times larger than another number. If you subtract the smaller number from the larger number the result is 20. What is the numbers?

4. Four consecutive numbers have a total of 38. What are the numbers?

5. Gary is seven years older than Mike. The sum of their ages is fifty-seven. How old is each person?

6. Lake Corn is six times as deep as Lake Wilson. If the difference in their depths is 45 m, how deep is each lake?

7. Three times the sum of a number and two is equaled to 42. Find the number.

8. Dana is collecting red and blue smarties. She has two less than three times as many red ones as blue ones. If the total number of smarties is 42. How many of each colour does she have?

9. John has three less than twice as many vampire books as werewolf books. If he has a total of 21 books, how many of each type does he have?

10. A piggy bank has a ten coins in it. If there are two-thirds as many quarters as nickels, what is the total value of money in the bank?

11. One number is three less than one-half of another number. If the sum of the numbers is 27, what is the numbers?

12. Three consecutive even numbers has a total of 36. What are the numbers?

Answers

1) Number is -9

2) Molly is 15
Mary is 18

3) Numbers are 24 & 4

4) Numbers are 8, 9, 10 & 11

5) Mike is 25
Gary is 32

6) Wilson lake is 9 m
Corn lake is 54 m

7) Number is 12

8) 11 blue smarties
31 red smarties

9) 8 Werewolf books
13 Vampire books

10) Total Value is $1.30

11) Number are 20 & 7

12) Number are 10, 12, & 14