Warm-Up

Write an algebraic equation representing each of the following situations.

1. You have a bowl of M&M's which includes some red and some blue candies. There are a total of 120 M&M's in the bowl.

r = # of red
b = # of blue

$120 = r + b$
$r + b = 120$

2. You are purchasing wrapping supplies for the holidays. You buy *x* rolls of wrapping paper for $3 apiece and *y* gift bags for $4 apiece. You spend a total of $56.

$3x + 4y = 56$

Real-World Systems of Equations

Clear Learning Target

You will be able to solve real-world situations using problem solving skills related to systems of equations.

Example #1: A test has twenty questions worth 100 points. The test consists of True/False questions worth 3 points each and multiple choice questions worth 11 points each. How many of each question type are on the test?

x = # of T/F y = # of M.C.

$3x + 11y = 100 \rightarrow 3x + 11y = 100$

$3(x + y = 20) \rightarrow 3x + 3y = 60$

$8y = 40$

$\frac{8y}{8} = \frac{40}{8}$

$y = 5$

$20 - 5 = 15 = x$

15 True or False

5 multiple choice

Example #2: Bill and Steve spend the day at a theme park.

- Bill rides the Ferris wheel 3 times and the water slide 3 times and spends a total of $17.70.
- Steve rides the Ferris wheel 3 times and the water slide 2 times and only spends $15.55.

How much does it cost to ride the Ferris wheel?

f = $ ferris wheel w = $ of water slide

$3f + 3w = 17.70$

$-(3f + 2w = 15.55)$

$1f + 1w = 2.15$

$w = 2.15$

$3f + 2(2.15) = 15.55$

$3f + 4.30 = 15.55$

$-4.30 \quad -4.30$

$\frac{3f}{3} = \frac{11.25}{3}$

$f = 3.75$

Ferris wheel costs $3.75

Example #4: The sum of two numbers is 90. The larger number is 14 more than 3 times the smaller number. Find the numbers.

a = larger #, q = smaller #

$a + q = 90$

$a = 14 + 3q$

$14 + 3q + q = 90$

$14 + 4q = 90$

$-14 \quad -14$

$\frac{4q}{4} = \frac{76}{4}$

$q = 19$

$90 - 19 = 71 = a$