Using Systems for Problem Solving Part Day 2

1.) Set-up an equation to model <u>each</u> situation (you will have two equations with the same variables)

2.) Solve the system use one of our three algebraic methods

1.) Tom's gym charges $12 membership and $3 per day. Mike's gym charges $5 membership and $4 per day. At how many day's will the memberships cost the same?

y - Total bill

x - # of days

Tom $y = 12 + 3x$

Mike $y = 5 + 4x$

$$12 + 3x = 5 + 4x$$
$$-3x \qquad -3x$$
$$12 = 5 + x$$
$$-5 \quad -5$$
$$7 = x$$

$$y = 5 + 4(7)$$
$$y = 33$$

they will cost the same $33 on the 7th day.

2.) Verizon has an initial fee of $125 and a monthly charge of $50. AT&T has an initial fee of $75 and a monthly fee of $60. For how many months will the programs cost the same?

y - Total

x - # of months

Verizon $y = 125 + 50x$

AT&T $y = 75 + 60x$

$125 + 50x = 75 + 60x$

$-50x \qquad -50x$

$125 = 75 + 10x$

$-75 \quad -75$

$\frac{50}{10} = \frac{10x}{10}$

$5 = x$

$y = 125 + 50(5)$

$y = 375$

They will cost the same $375 on the 5th month.

Mike and Willie are selling flower bulbs for a school fundraiser. Customers can buy packages of tulip bulbs and packages of crocus bulbs. Mike sold 12 packages of tulip bulbs and 7 packages of crocus bulbs for a total of $272. Willie sold 6 packages of tulip bulbs and 5 packages of crocus bulbs for a total of $166. What is the cost each of one package of tulips bulbs and one package of crocus bulbs?

T - cost of tulips

C - cost of crocus

$$12T + 7C = 272$$

$$2(6T + 5C) = (166)2$$

$$12T + 10C = 332$$

$$-(12T + 7C = 272)$$

$$\frac{3C}{3} = \frac{60}{3}$$

$$C = 20$$

$$6T + 5(20) = 166$$

$$6T + 100 = 166$$

$$-100 \quad -100$$

$$\frac{6T}{6} = \frac{66}{6}$$

$$T = 11$$

Tulips cost $11 and crocus cost $20.

The state fair is a popular field trip destination. This year the senior class at High School A and the senior class at High School B both planned trips there. The senior class at High School A rented and filled 1 van and 6 buses with 135 students. High School B rented and filled 14 vans and 12 buses with 450 students. Every van had the same number of students in it as did the buses. Find the number of students in each van and in each bus.

v - # of students in a van

b - # of students in a bus

$2(v + 6b) = (135)2$

$14v + 12b = 450$

$-(2v + 12b = 270)$

$\frac{12v}{12} = \frac{180}{12}$

$v = 15$

$15 + 6b = 135$

$-15 \qquad -15$

$\frac{6b}{6} = \frac{120}{6}$

$b = 20$

Each van has 15 students and each bus has 20 students.