Ch 4
Day 5
HW

SYSTEMS WITH THREE VARIABLES WS #2

Name: _____

Date: _____ Period: _____

Solve the system algebraically. Show your work. Unlike yesterday, you might get a fraction for an answer. Check the key often!

1. $\begin{cases} x - 3y + 3z = -4 \\ 2x + 3y - z = 15 \\ 4x - 3y - z = 19 \end{cases}$ $(5, 1, -2)$

2. $\begin{cases} 3x + 4y + 2z = 6 \\ x + 3y - 5z = -7 \\ 5x + 7y - 3z = 3 \end{cases}$ $(4, -2, 1)$

3) $\begin{cases} 3x + 4y = 19 \\ 2y + 3z = 8 \\ 4x - 5z = 7 \end{cases}$ $(3, \frac{5}{2}, 1)$

WORD PROBLEMS!

*Define all variables.
*You must set up equations and solve the following systems.

4) The sum of three numbers is 18. The third number is four times the second, and the second number is 6 more than the first. Find the numbers.

$x = \#1$

$y = \#2$

$z = \#3$

$x + y + z = 18$

$z = 4y$

$y = x + 6$

$\Rightarrow$

$$\begin{cases} x + y + z = 18 \\ -4y + z = 0 \\ -x + y = 6 \end{cases}$$

$x = -2$

$y = 4$

$z = 16$

5) A factory manufactures three types of footballs at a monthly cost of $2425 for 1125 footballs. The manufacturing costs for the three types of footballs are $4, $3 and $2. These footballs sell for $16, $12, and $10, respectively. How many of each type are manufactured if the monthly profit is $9275?
(HINT: Profit = Income – Cost)

x = # of \$4 footballs

y = # of \$3 footballs

z = # of \$2 footballs

$x + y + z = 1125$

$4x + 3y + 2z = 2425$ ← cost!

$12x + 9y + 8z = 9275$ ← profit

These coefficients are not 16, 12, 10 b/c you have to account for the cost of producing each football. $16 - 4 = 12$ ← this is the profit from the first type of football

50 type 1 footballs,
75 type 2 footballs,
1000 type 3 footballs

6) The sum of the measures of the angles of a triangle is 180^0. In a given triangle, the measure of the second angle is twice the measure of the first. The measure of the third angle is 30^0 less than the sum of the measures of the first two. Find the measure of each angle.

$x = m\angle 1$

$y = m\angle 2$

$z = m\angle 3$

$x + y + z = 180$

$y = 2x$

$z = (x + y) - 30$

$\Rightarrow$ $\begin{cases} x + y + z = 180 \\ -2x + y + 0z = 0 \\ x + y - z = 30 \end{cases}$

or $(-x - y + z = -30)$

$m\angle 1 = 35^\circ$

$m\angle 2 = 70^\circ$

$m\angle 3 = 75^\circ$

7) Fifteen band members from your school were selected to play in the state orchestra. There are twice as many students who play a wind instrument as there are students who play a string or percussion instrument. Of the students selected, one fifth play a string instrument. How many students playing each type of instrument were selected to play in the state orchestra?

x = # of students that play a wind instrument

y = # that play strings

z = # that play percussion

$x + y + z = 15$

$x = 2(y + z)$

$y = 3$ b/c one fifth play strings!

$\Rightarrow$ $\begin{cases} x + y + z = 15 \\ x - 2y - 2z = 0 \\ 0x + 1y + 0z = 3 \end{cases}$

$x = 10$

$y = 3$

$z = 2$

There are 10 wind instruments, 3 string instruments, and 2 percussion instruments.