Lesson Title 4.5 Systems of Linear Equations Problem Solving DAY ONE NOTES B2A2 Date _____

PROBLEM SOLVING STEPS:

1) UNDERSTAND the problem
   - Reread it, choose variables to be the unknowns, construct a drawing
2) TRANSLATE the problem into two equations
   - Both in y = mx + b form to graph or solve by substitution
3) SOLVE the system of equations
   - Graphing, substitution, or elimination
4) INTERPRET the results
   - Put the answer in terms of the scenario of the word problem
5) CHECK the proposed solution in the stated problem
   - Is your answer possible, does it make sense?

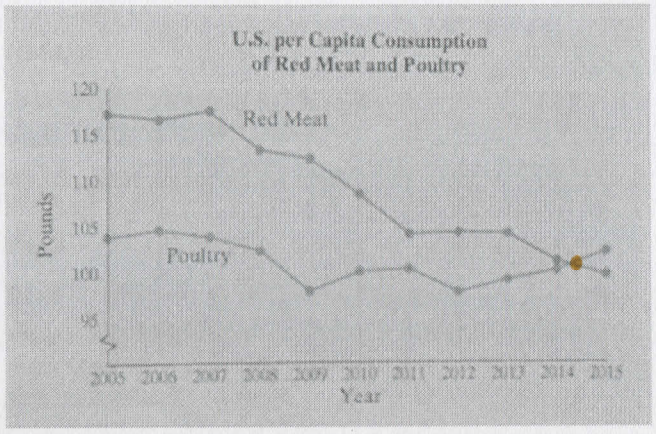
OBJECTIVE 1: Solving Problems Modeled by Systems of Two Equations

HINTS:

- Read the problem carefully
- Cross out information you do not need
- Do NOT use the same information more than once

TASK 1: Predicting Equal Consumption of Red Meat & Poultry

America's consumption of red meat has decreased most years since 2005, while consumption of poultry has decreased also, but by a much smaller amount. The equation y = - 2.03x + 119.05 approximates the annual pounds of red meat consumed per capita, where x is the number of years since 2005. The equation y = - 0.41x + 103.21 approximates the annual pounds of poultry consumed per capita, where x is also the number of years since 2005. Based on this trend, determine the year when the annual consumption of red meat and poultry is equal.



$x = 9.718 \Rightarrow \approx 2015$

$y = 99.323 \Rightarrow \approx 100$ lbs

Almost 2015 both consumed nearly 100 lbs

TASK 2: Finding Unknown Numbers

Find two numbers whose sum is 37 and whose difference is 21.

Variables: x = 1st # y = 2nd #

Equations:

$$x + y = 37$$
$$x - y = 21$$

Solve:

$$\begin{array}{r} x+y=37 \\ +\ x-y=21 \\ \hline 2x=58 \end{array}$$

$x = 29$ → $29 + y = 37$, $y = 8$

Check: $29 + 8 = 37$ ✓

$29 - 8 = 21$ ✓

Solution: The 1st # is 29 and the 2nd # is 8.

TASK 3: Finding Unknown Numbers

Find two numbers whose sum is 30 and whose difference is 6.

Variables: x = 1st # y = 2nd #

Equations:

$$x + y = 30$$
$$x - y = 6$$

Solve:

$2x = 36$, $x = 18$ → $18 + y = 30$, $y = 12$

Check: $18 + 12 = 30$ ✓

$18 - 12 = 6$ ✓

Solution: The first number is 18 and the second number is 12.

Still need help with: