

Unit 6-Part 2 Review: System of Equations Applications

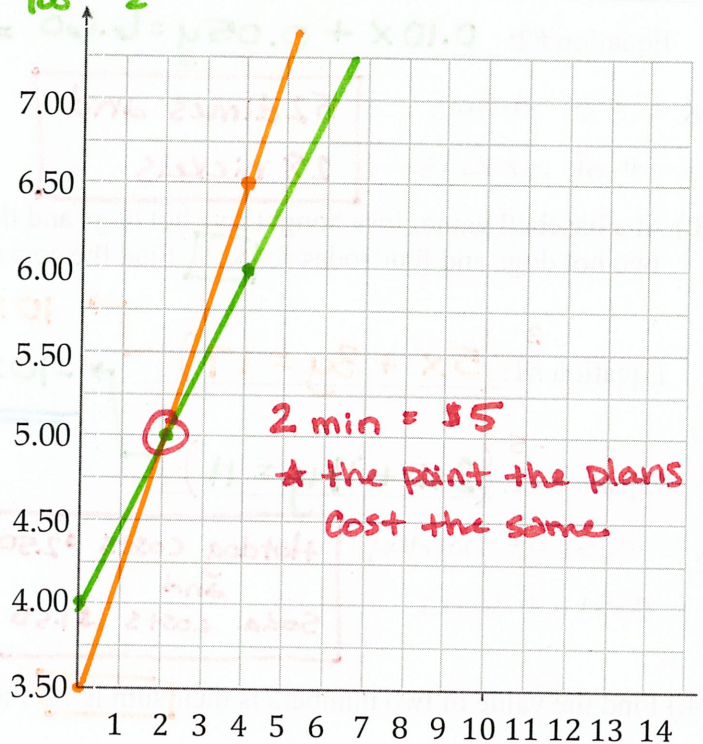
1.) The telephone company offers two types of service. **With Plan A, you pay \$3.50 monthly, plus 75 cents for each min of calls.** **With Plan B, you pay \$4.00 monthly, plus 50 cents for each min. of calls.**

a.) Create the equations for both types of services. Then graph the cost of each plan on the grid to the right.

Plan A
Equation 1: $y = \frac{3}{4}x + 3.50$

Plan B
Equation 2: $y = \frac{1}{2}x + 4$

$\frac{15}{100} = \frac{3}{4}$
 $\frac{50}{100} = \frac{1}{2}$
x = # of minutes



b.) Explain when you would purchase each plan.

I would purchase plan A if
I needed to talk less than
2 minutes and plan B if I
needed more than 2 minutes
of calls per month.

c.) Use the equations from part 1a and show an algebraic solution to this problem. (Elimination / Substitution)

Choose 1 method

Substitution:
 $y = \frac{3}{4}x + 3.50$
 $y = \frac{1}{2}x + 4 \rightarrow y = \frac{1}{2}(2) + 4$

Elimination:
 $-\frac{3}{4}x + y = 3.50$
 $\frac{1}{2}x - y = -4$

$\frac{1}{2}x + 4 = \frac{3}{4}x + 3.50$
 $\frac{2}{4}x - \frac{3}{4}x = -\frac{3}{4}x$
 $y = 5$
 $(2, 5)$

$(-\frac{4}{1}) - \frac{1}{4}x = -0.50(-\frac{4}{1})$
 $x = 2$

$-\frac{1}{4}x + 4 = 3.50$
 $-\frac{1}{4}x = -0.50$

$y = \frac{1}{2}(2) + 4$

$(-\frac{4}{1}) - \frac{1}{4}x = -0.50(-\frac{4}{1})$

$y = 5$
 $(2, 5)$

$x = 2$

2.) Dennis mowed his next door neighbor's lawn for a handful of dimes and nickels, 80 coins in all. Upon completing the job he counted out the coins and it came to \$6.60. How many of each coin did he earn?

Equation #1: $x + y = 80$ $\Rightarrow -0.10x - 0.10y = -8$ $x + 28 = 80$

Equation #2: $0.10x + 0.05y = 6.60$ $\Rightarrow \underline{0.10x + 0.05y = 6.60}$ $\underline{-0.10x - 0.10y = -8}$ $x = 52$

x = # of dimes
y = # of nickels

**52 dimes and
28 nickels**

3.) At a baseball game, Jose bought five hot dogs and three sodas for \$17. At the same time, Allison bought two hot dogs and four sodas for \$11. Find the cost of one hot dog and one soda.

Equation #1: $5x + 3y = 17$ $\begin{cases} \rightarrow 10x + 6y = 34 \\ \rightarrow -10x - 20y = -55 \end{cases}$

Equation #2: $2x + 4y = 11$ $\begin{cases} \rightarrow -14y = -21 \\ \rightarrow y = 1.50 \end{cases}$

x = cost of hot dog
y = cost of soda

**Hotdog costs \$2.50
and
Soda costs \$1.50**

$2x + 4(1.50) = 11$

$2x + 6 = 11$

$2x = 5$

$x = 2.50$

4.) Find the value of two numbers is their sum is 12 and their difference is 4.

Equation #1: $x + y = 12 \rightarrow x + y = 12$

Equation #2: $x - y = 4 \rightarrow \underline{x - y = 4}$ $\underline{2x = 16}$ $x = 8$

x = 1st number

y = 2nd number

$8 + y = 12$

$y = 4$

**The two numbers are
8 and 4**

5.) Matt and Cindy are selling fruit for a school fundraiser. Customers can buy small boxes of oranges and large boxes of oranges. Matt sold 3 small boxes of oranges and 14 large boxes oranges for a total of \$203. Cindy sold 11 small boxes of oranges and 11 large boxes of oranges for a total of \$220. Find the cost each of one small box of oranges and one large box of oranges.

Equation #1: $3x + 14y = 203$ $\begin{cases} \rightarrow 33x + 154y = 2233 \\ \rightarrow -33x - 33y = -660 \end{cases}$

Equation #2: $11x + 11y = 220$ $\underline{121y = 1573}$ $y = 13$

x = cost of small box

y = cost of large box

$3x + 14(13) = 203$

$3x + 182 = 203$

$3x = 21$

$x = 7$

**The small box of oranges costs \$7
and the large box of oranges cost \$13**