Assignment 6.1_4	**Period (circle one):** 5 7	**Date:** 11/15/15	**Name:** Key

Write a system of linear equations to represent each problem situation. Define each variable. Then, graph the system of equations and estimate the break-even point. Explain what the break-even point represents with respect to the given problem situation.

. Jerome sells flowers for $12 per bouquet through his Internet flower site. Each bouquet costs him $5.70 to make. Jerome also paid a one-time fee of $150 for an Internet marketing firm to advertise his company.

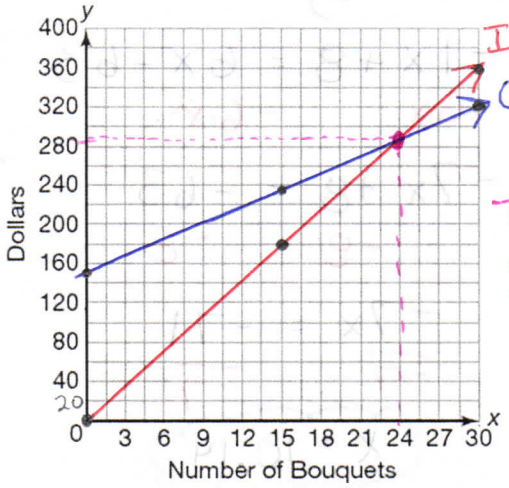
x = the number of flower bouquets sold
$C(x)$ = the cost of selling x flower bouquets
$I(x)$ = the income from selling x bouquets

$C(x) = 5.70x + 150$

x	$C(x)$
0	150
15	235.5
30	321

$I(x) = 12x$

x	$I(x)$
0	0
15	180
30	360



The break-even point is about (24, 280). This means, that when Jerome sells 24 bouquets, he will have made the same amount of money that he has spent.

Solve each system of equations by substitution. Determine whether the system is consistent or inconsistent. Goal: To see when these two graphs are the same

- $\begin{cases} 0.8x - 0.2y = 1.5 \\ 0.1x + 1.2y = 0.8 \end{cases}$

Step 1: get y by itself

$0.8x - 0.2y = 1.5$
$-0.8x \quad -0.8x$
$\frac{-0.2y}{-0.2} = \frac{-0.8x}{-0.2} + \frac{1.5}{-0.2}$
$y = 4x - 7.5$

$0.1x + 1.2y = 0.8$
$-0.1x \quad -0.1x$
$\frac{1.2y}{1.2} = \frac{-0.1x}{1.2} + \frac{0.8}{1.2}$
$y = -0.08x + 0.67$

$2 \cdot \left(\frac{1}{2}x + \frac{3}{2}y = 4\right) \rightarrow 1x + 3y = 8$
$3 \cdot \left(\frac{2}{3}x - \frac{1}{3}y = 7\right) \rightarrow 2x - 1y = 21$

$1x + 3y = 8$
$-1x \quad -1x$
$\frac{3y}{3} = \frac{-1x}{3} + \frac{8}{3}$
$y = -\frac{1}{3}x + \frac{8}{3}$

$2x - 1y = 21$
$-2x \quad -2x$
$\frac{-1y}{-1} = \frac{-2x}{-1} + \frac{21}{-1}$
$y = 2x - 21$

(continued on back)

Step 2: Set equations equal, and solve for x

$$\begin{cases} y = 4x - 7.5 \\ y = -0.08x + 0.67 \end{cases}$$

$$4x - 7.5 = -0.08x + 0.67$$

$$+0.08x \qquad +0.08x$$

$$4.08x - 7.5 = 0.67$$

$$+7.5 \qquad +7.5$$

$$4.08x = 8.17$$

$$\frac{4.08x}{4.08} = \frac{8.17}{4.08}$$

$$x = 2$$

$$\begin{cases} y = -\frac{1}{3}x + \frac{8}{3} \\ y = 2x - 21 \end{cases}$$

$$-\frac{1}{3}x + \frac{8}{3} = 2x - 21$$

$$3 \cdot \left(-\frac{1}{3}x + \frac{8}{3} = 2x - 21\right)$$

$$-1x + 8 = 6x - 63$$

$$-6x \qquad -6x$$

$$-7x + 8 = -63$$

$$-8 \qquad -8$$

$$-7x = -71$$

$$\frac{-7x}{-7} = \frac{-71}{-7}$$

$$x = 10.14$$

Step 3: Plug in the value of x into one of the equations and solve for y

$x = 2$

$y = 4x - 7.5$

$y = 4(2) - 7.5$

$y = 0.5$

$x = 10.14$

$y = 2x - 21$

$y = 2(10.14) - 21$

$y = -0.72$

Step 4: Write the solution as an ordered pair, (x, y)

Solution:

$(2, 0.5)$

Solution

$(10.14, -0.72)$