

Name: Key

Hour: _____ Date: _____

Review of Systems of Equations Quiz Review

- 1) The spreadsheet below shows the monthly income and expenses for a new business.

	A	B	C
	Month	Income	Expenses
5	May	\$1500 ^{1.5}	\$21,400 ^{21.4}
6	June	\$3500 ^{3.5}	\$18,800 ^{18.8}
7	July	\$5500 ^{5.5}	\$16,200 ^{16.2}
8	August	\$7500 ^{7.5}	\$13,600 ^{13.6}

Using linear regression find a linear equation to model both the income and expenses of the new business.

Using these models find the month at which the income and expenses will be equal.

- a. Equation 1 (Income):

$$y = 2x - 8.5$$

$$y = 2000x - 8500$$

- b. Equation 2 (Expenses):

$$y = -2.6x + 34.4$$

$$y = -2600x + 34,400$$

- c. Solution:

$$(9.33, 10.2)$$

$$(9.33, 1,020 + 4)$$

- d. Explanation:

→ means (9.33, 10,200)

- i. During which month will the income and expenses be equal?

September (the 9th month)

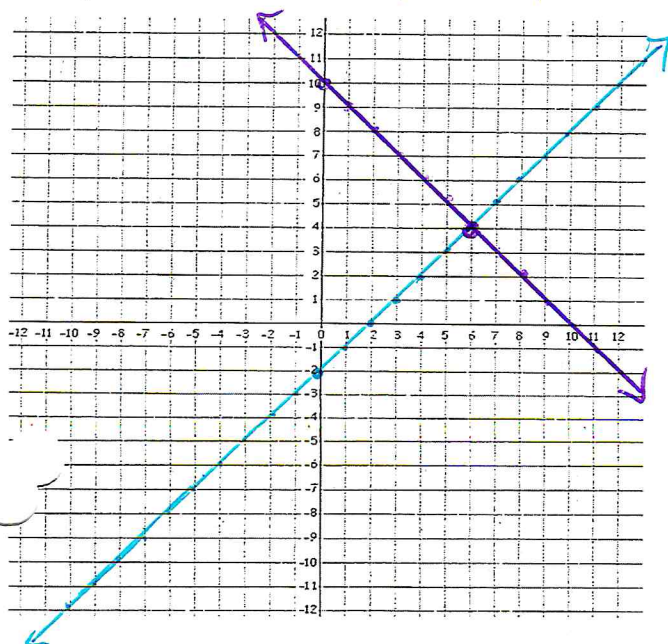
- ii. At what dollar amount will be the value of the income and expenses when they are equal?

\$10,200

Solve each of the following systems by graphing. CHECK YOUR SOLUTIONS.

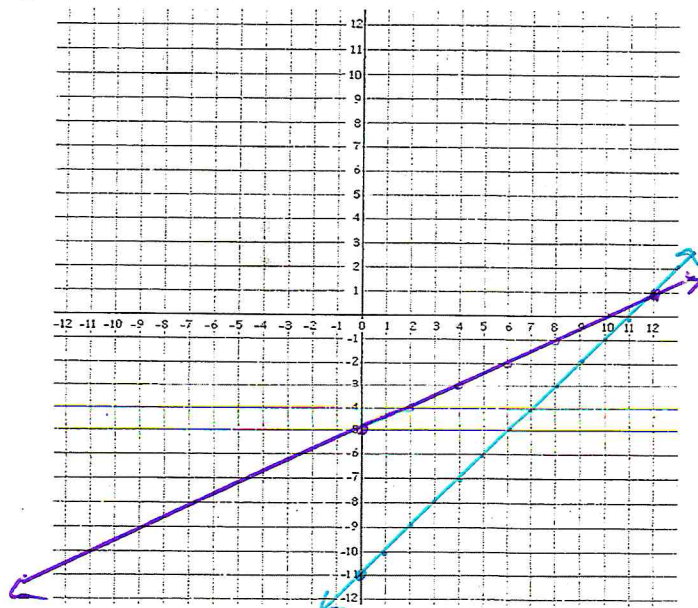
2) $y = x - 2$
 $y = -x + 10$

(6, 4)



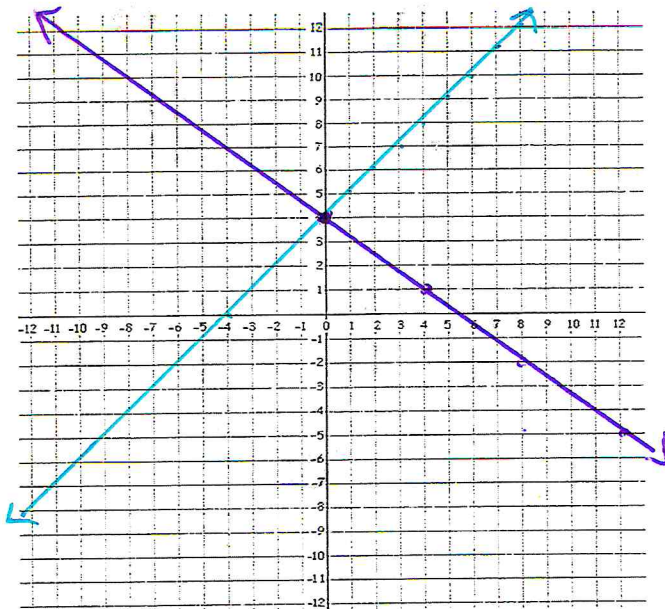
3) $y = x - 11$
 $y = \frac{1}{2}x - 5$

(12, 1)



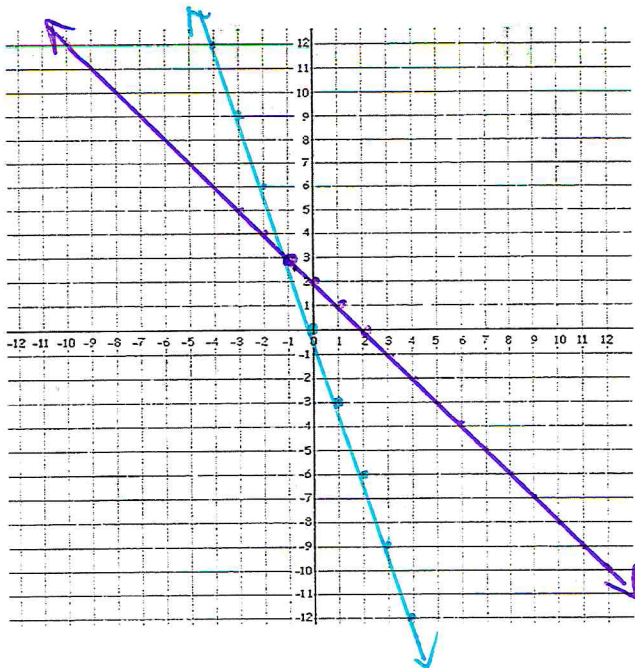
4) $y = x + 4$
 $y = -\frac{3}{4}x + 4$

$(0, 4)$



5) $y = -3x + 0$
 $y = -x + 2$

$(-1, 3)$



Solve each system by elimination. CHECK YOUR SOLUTIONS.

6) $x + y = 10$
 $-x - y = 2$

$0 = 12$ False

No Solution

7) $-x + 3y = -1$
 $x - 2y = 2$

$y = 1$

$x - 2(1) = 2$
 $x - 2 = 2$
 $x = 4$

$(4, 1)$

8) $x + 2y = 10$
 $2(3x - y = 9)$

$\rightarrow x + 2y = 10$
 $\rightarrow 6x - 2y = 18$

$\frac{7x}{7} = \frac{28}{7}$

$x = 4$

$4 + 2y = 10$
 -4
 $2y = 6$
 $y = 3$

$(4, 3)$

9) $\begin{cases} 3x + 5y = 10 \\ 5x + 7y = 10 \end{cases} \rightarrow \begin{cases} 15x + 25y = 50 \\ -15x - 21y = -30 \end{cases}$

$\frac{4y}{4} = \frac{20}{4}$

$y = 5$

$3x + 5(5) = 10$

$3x + 25 = 10$
 -25
 $3x = -15$
 $x = -5$

$(-5, 5)$

Solve the following using substitution. CHECK YOUR SOLUTIONS.

10) $y = x + 1$
 $2x + y = 7$

$$\begin{aligned} 2x + (x+1) &= 7 \\ 2x + x + 1 &= 7 \\ 3x + 1 &= 7 \\ \underline{-1 \quad -1} & \\ 3x &= 6 \\ \underline{\frac{3x}{3} = \frac{6}{3}} & \\ x &= 2 \end{aligned}$$

$$\begin{aligned} y &= 2 + 1 \\ y &= 3 \end{aligned}$$

$$\boxed{(2, 3)}$$

11) $y = 2x + 3$
 $5x - y = -3$

$$\begin{aligned} 5x - (2x+3) &= -3 \\ 5x - 2x - 3 &= -3 \\ 3x - 3 &= -3 \\ \underline{+3 \quad +3} & \\ 3x &= 0 \\ \underline{\frac{3x}{3} = \frac{0}{3}} & \\ x &= 0 \end{aligned}$$

$$\begin{aligned} y &= 2(0) + 3 \\ y &= 0 + 3 \\ y &= 3 \end{aligned}$$

$$\boxed{(0, 3)}$$

12) $3x + 5y = 2$
 $x = -4y - 4$

$$\begin{aligned} 3(-4y-4) + 5y &= 2 \\ -12y - 12 + 5y &= 2 \\ -7y - 12 &= 2 \\ \underline{+12 \quad +12} & \\ -7y &= 14 \\ \underline{\frac{-7y}{-7} = \frac{14}{-7}} & \\ y &= -2 \end{aligned}$$

$$\begin{aligned} x &= -4(-2) - 4 \\ x &= 8 - 4 \\ x &= 4 \end{aligned}$$

$$\boxed{(4, -2)}$$

13) $x = -6y + 15$
 $-x + 4y = 5$

$$\begin{aligned} -(-6y+15) + 4y &= 5 \\ 6y - 15 + 4y &= 5 \\ 10y - 15 &= 5 \\ \underline{+15 \quad +15} & \\ 10y &= 20 \\ \underline{\frac{10y}{10} = \frac{20}{10}} & \\ y &= 2 \end{aligned}$$

$$\begin{aligned} x &= -6(2) + 15 \\ x &= -12 + 15 \\ x &= 3 \end{aligned}$$

$$\boxed{(3, 2)}$$

Solve the following using any method that you wish... Determine if there is one solution, infinitely many solutions or no solution. Explain your reasoning...

14) $x + y = 3$
 $y = 2x - 3$

Substitution

$$\begin{aligned} x + (2x-3) &= 3 \\ x + 2x - 3 &= 3 \\ 3x - 3 &= 3 \\ \underline{+3 \quad +3} & \\ 3x &= 6 \\ \underline{\frac{3x}{3} = \frac{6}{3}} & \\ x &= 2 \end{aligned}$$

$$\begin{aligned} y &= 2(2) - 3 \\ y &= 4 - 3 \\ y &= 1 \end{aligned}$$

$$\boxed{(2, 1)}$$

15) $2x + y = 3$
 $y = -2x - 1$

Substitution

$$\begin{aligned} 2x + (-2x-1) &= 3 \\ 2x - 2x - 1 &= 3 \\ -1 &= 3 \\ \text{False} \end{aligned}$$

$$\boxed{\text{No Solution}}$$

16) $x + 3y = 9$
 $-2x - 6y = -18$

Elimination

$$\begin{aligned} + 2x + 6y &= 18 \\ -2x - 6y &= -18 \\ \hline 0 &= 0 \\ \text{True} \end{aligned}$$

$$\boxed{\text{Infinitely Many Solutions}}$$

