Name: _____ Date: _____

Unit 1: Linear Systems – Quiz #2

LS3	I am learning to use graphs to solve a pair of linear equations simultaneously.	/5

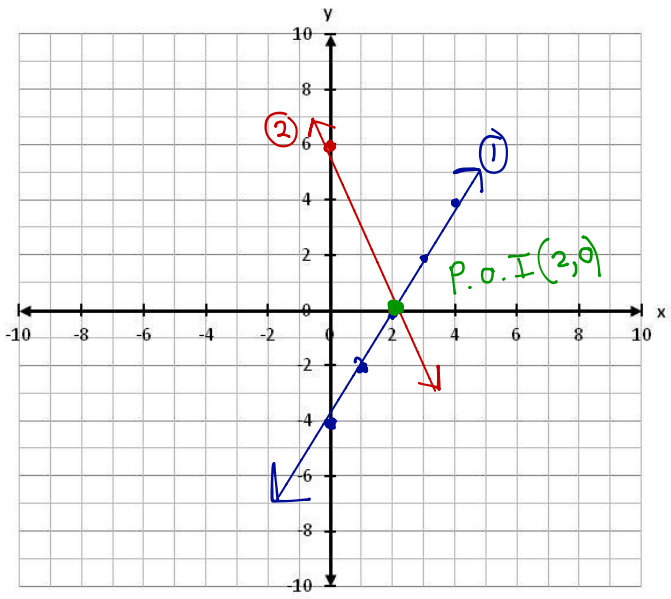
1. Solve the following linear system graphically. State the P.O.I. **(5 marks)**

① $y = 2x - 4$

② $3x + y = 6$

y Int. $y = 6$
$x = 0$

x Int. $y = 0$
$3x = 6$
$x = 2$



LS1	I am learning to model problems involving the intersection of straight lines using tables, graphs, and equations.	/4

1. Mrs. Neave needs 200 g of chocolate that is 86% cocoa for a cake recipe. She has one kind of chocolate that is 99% cocoa and another kind that is 70% cocoa. How much of each kind of chocolate does he need to make the cake?

(a) Assign each unknown in the situation a variable, explaining in a statement what the chosen variable represents. **(2 marks)**

Let n represent the amount of 99% cocoa

Let s represent the amount of 70% cocoa.

(b) Represent this situation with a linear system. (2 Equations) **(2 marks)**

① $n + s = 200$

② $0.99n + 0.7s = 0.86(200)$
$0.99n + 0.7s = 172$

Name: _____ Date: _____

LS2	I am learning to solve systems of linear equations involving variables using an algebraic method.	/6

2. Solve the following linear system algebraically (substitution method). Show all of your work. **(6 marks)**

① $2x - 5y = -27$

② $x + 3y = 3$

Isolate x in ②

$x = 3 - 3y$ ③

Sub. ③ into ①

$2x - 5y = -27$

$2(3-3y) - 5y = -27$

$6 - 6y - 5y = -27$

$6 - 11y = -27$

$-11y = -27 - 6$

$-11y = -33$

$\frac{-11y}{-11} = \frac{-33}{-11}$

$y = 3$ → sub into ③

$x = 3 - 3y$

$x = 3 - 3(3)$

$x = 3 - 9$

$x = -6$

P.O.I. $(-6, 3)$

Pg. 39 #7

250 g
500 g

186.5 kg

$= 186.5 \times 1000$

$= 186\,500$ g

Let t represent # of 250 g jars
Let b represent # of 500 g jars

① $t + b = 511$

② $250t + 500b = 186\,500$

Isolate t in ①

$t = 511 - b$ ③

sub. ③ into ②

$250t + 500b = 186\,500$

$250(511 - b) + 500b = 186\,500$

$127\,750 - 250b + 500b = 186\,500$

$127\,750 + 250b = 186\,500$

$250b = 186\,500 - 127\,750$

$250b = 58750$

$b = \frac{58750}{250}$

$b = 235$

$t = 511 - b$

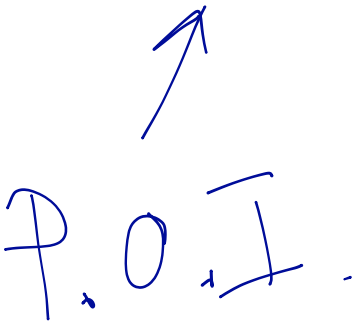
$t = 511 - 235$

$t = 276$

∴ 276 250 g jars
235 500 g jars

Big Ideas

- Equivalent Systems of Linear Equations
  - Two or more systems of linear equations that have the same solution.



More Big Ideas

- You can create an equivalent system of linear equations by:
  - Adding or subtracting the equations in a linear system.
  - Multiplying one or both equations of a system by a constant other than 0.

Example

- Consider the linear system:

$$x - 3y = 2 \quad (1)$$
$$2x + y = -5 \quad (2)$$

- Add and subtract the equations to create an equivalent linear system.
- Multiply each equation in the system by a different constant to create another equivalent linear system.

① $x - 3y = 2$

② $2x + y = -5$

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③ $3x - 2y = -3$

① $x - 3y = 2$

② $2x + y = -5$

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④ $-x - 4y = 7$

① & ② have the same P.O.I. as ③ & ④

① $x - 3y = 2$

② $2x + y = -5$

Eqn ① x2

③ $2x - 6y = 4$

② − ③

Eliminated a variable

$$\begin{array}{r} 2x + y = -5 \\ 2x - 6y = 4 \\ \hline 0 + 7y = -9 \end{array}$$

Consolidation

- A teacher claims that these systems of linear equations are equivalent. Is she correct?

System A	System B	System C
$3x - 2y = 2$ ① $-10x + 3y = 8$ ②	$-7x + y = 10$ $13x - 5y = -6$	$x = -2$ ✓ $y = -4$ ✓

Solve A

Isolate y in ①

$3x - 3x - 2y = 2 - 3x$

$\frac{-2y}{-2} = \frac{2}{-2} - \frac{3x}{-2}$

$y = -1 + 1.5x$ ③

③ into ② $-10x + 3(-1 + 1.5x) = 8$

$-10x - 3 + 4.5x = 8$

$-5.5x = 11$

$x = \frac{11}{-5.5}$

$x = -2$

$y = -1 + 1.5(-2)$

$y = -1 - 3$

$y = -4$

System B

$-7x + y = 10$ ①

$13x - 5y = -6$ ②

Isolate y in ① $y = 10 + 7x$ ③

Sub ③ in ②

$13x - 5y = -6$

$13x - 5(10 + 7x) = -6$

$13x - 50 - 35x = -6$

$-22x = -6 + 50$

$-22x = 44$

$x = \frac{44}{-22}$

$\boxed{x = -2}$

③ $y = 10 + 7x$

$y = 10 + 7(-2)$

$y = 10 - 14$

$\boxed{y = -4}$

∴ System A, B & C are equivalent.

Reinforcement

- Pages 46 – 48
  - #3, 4, 6, 8a

Note for 1.6 on line tonight.