"Teacher"

Name _____ d 1 Date 1/30/17 **Section 2.S.1**

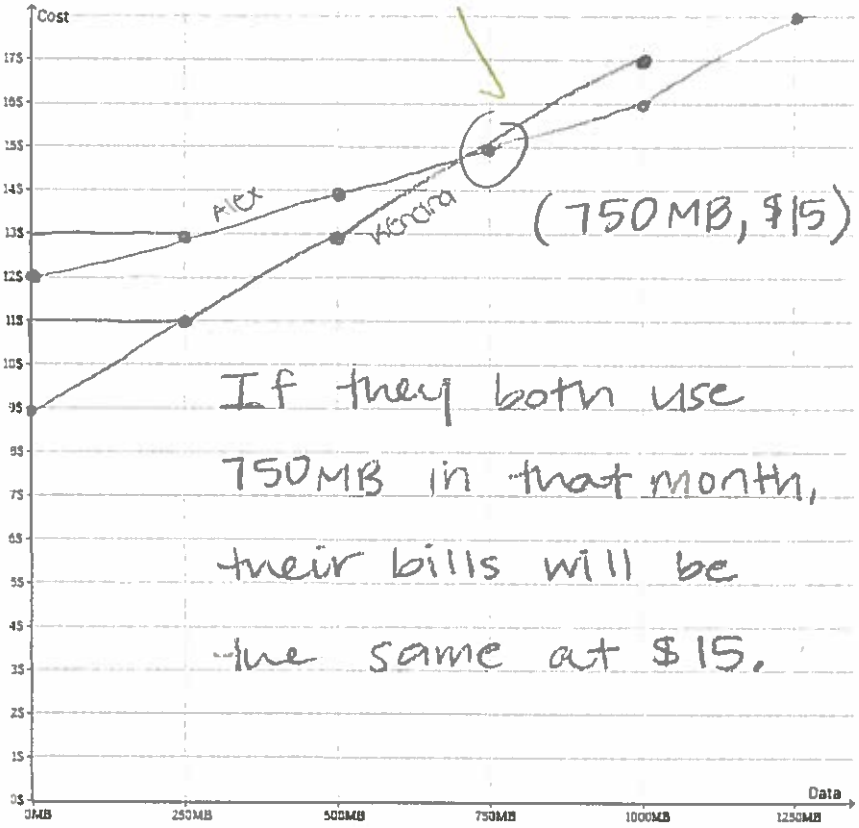
**Slope-Intercept Form Systems of Equations**

Alex's phone plan costs $12 per month plus an additional $1 for every 250MB of data he uses. Kendra's phone plan costs $9 per month plus an additional $2 for every 250MB of data she uses. Model Alex's and Kendra's phone plans with equations, tables, and graphs. Determine how many MB of data Alex and Kendra would have to use in a given month in order for their phone bill to be the same.

| | Alex | Kendra |
|---|---|---|
| Starting Point b | 12 | 9 |
| Rate of Change m | $\frac{1}{250}$mb | $\frac{2}{250}$mb |
| Slope-Int. Equation | $y = \frac{1}{250}x + 12$ | $y = \frac{2}{250}x + 9$ |

| Alex | |
|---|---|
| X | Y |
| 0 | 12 |
| 250 | 13 |
| 500 | 14 |
| 750 | 15 |
| 1000 | 16 |

| Kendra | |
|---|---|
| X | Y |
| 0 | 9 |
| 250 | 11 |
| 500 | 13 |
| 750 | 15 |
| 1000 | 17 |




What do you notice about the tables? I notice that both have 750 for x and 15 for y

What do you notice about the graph? they both both cross at 750 mb

How can we check our answer (for how much data would their bills be the same) using the equations?

Alex. $15 = \frac{1}{250}(750) + 12$

$15 = 3 + 12$

$15 = 15$ ✓

Kendra $15 \frac{2}{250}(750) + 9$

$15 \quad 6 + 9$

$15 = 15$ ✓

**Key Ideas**

| | |
|---|---|
| What is a System of linear equations? | Two or more linear equations form this. |
| What is the solution to a system? | Any ordered pair that makes math the equations in a system true is this. |
| How do we find a system's solution graphically? | Whereas a line represents all the solutions to *one* linear equation, the intersection point is the solution to *both* linear equations. |
| How do we find a system's solution using tables? | By starting at the y-intercept and following the pattern of the rate of change, eventually each table will show a point with the same x and y value. |
| How can we check the solution algebraically? | We can substitute our values for *x* and *y* into each equation. If both equations remain true statements, then we have found the correct solution. |

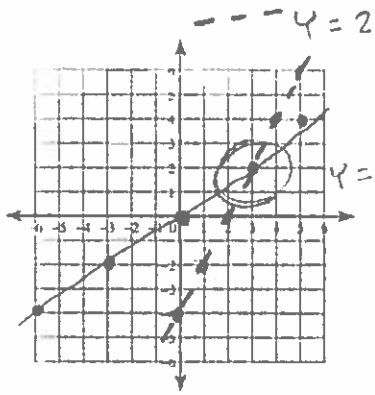
Solve the System by Making Tables and Graphing

Equation: $y = \frac{2}{3}x$

| X | Y |
|---|---|
| 0 | 0 |
| 1 | $\frac{2}{3}$ |
| 2 | $\frac{2}{3} \cdot \frac{2}{1} = \frac{4}{3}$ |
| 3 | $\frac{2}{3} \cdot \frac{3}{1} = \frac{6}{3} = 2$ |
| 4 | $\frac{2}{3} \cdot \frac{4}{1} = \frac{8}{3}$ |

Equation: $y = 2x - 4$

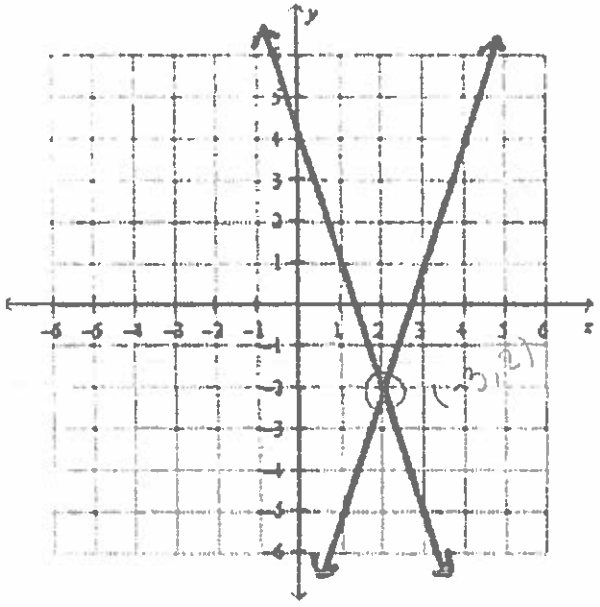
| X | Y |
|---|---|
| 0 | $2(0) - 4 = -4$ |
| 1 | $2(1) - 4 = -2$ |
| 2 | $2(2) - 4 = 0$ |
| 3 | $2(3) - 4 = 2$ |
| 4 | $2(4) - 4 = 4$ |



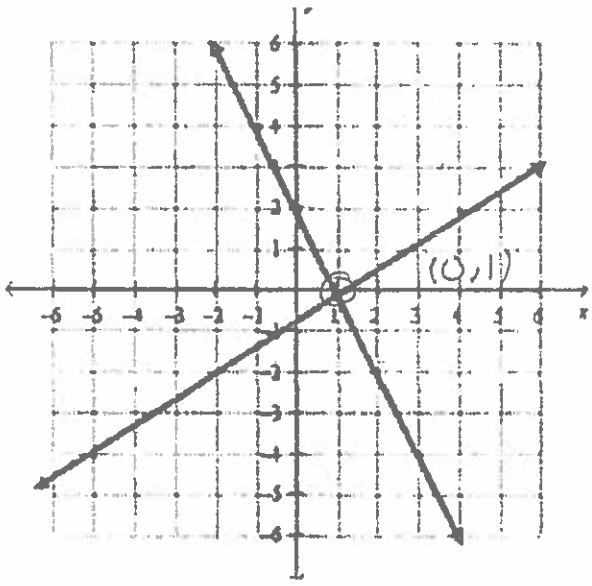

Solution: (3, 2)

**What is the solution to the system of linear equations?**

1) Solution: (-3 , 2 )



2) Solution: ( 0 , 1 )




The following two tables represent a system of linear functions. Extend the tables to find the solution.

3)

| x | y |
|---|---|
| −9 | 20 |
| −2 | 24 |
| 5 | 28 |
| 12 | 32 |
| 19 | 36 |
| 26 | 40 |
| 33 | 44 |

| x | y |
|---|---|
| −26 | 20 |
| −13 | 25 |
| 0 | 30 |
| 13 | 35 |
| 26 | 40 |
| 40 | 45 |
| 53 | 50 |

Solution: ( 26 , 40 )

4)

| x | y |
|---|---|
| 25 | 3 |
| 10 | 9 |
| −5 | 15 |
| −20 | 21 |
| −35 | 27 |
| −50 | 33 |

| x | y |
|---|---|
| −55 | −9 |
| −50 | 0 |
| −45 | 9 |
| −40 | 18 |
| −35 | 27 |
| −30 | 36 |

Solution: (−35 , 27 )