Adding one digit numbers:

$$+ \; 3 \; = \; \text{two of something}$$

three of something

$$3 : \text{thrwoee}$$

Solving linear systems:

Systems of linear equations

- linear <u>equation</u> :

$$ax + by = c$$
$$y = mx + b$$

$\left.\right\}$ graphs are straight lines
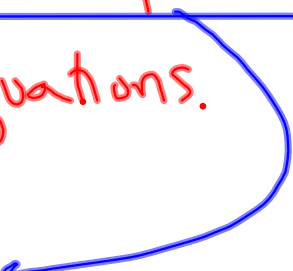
- linear system:
  - two (or more) linear equations

$$4x + 2y = 7$$
$$y = \frac{1}{2}x + 3$$

linear system

A <u>solution</u> to a linear system is a pair of x,y values (ordered pair) that are solutions to <u>both</u> equations.

one coordinate on a coordinate plane

Bill has 15 books, and gets 2 each month
Bilbo has 7 books, and gets 4 each month
How many months will it take for
them to have the same # of books?

$$Bill = 15 + 2m \qquad y = 2x + 15$$
$$Bilbo = 7 + 4m \qquad y = 4x + 7$$

$(4, 23)$

X	Bill y	Bilbo y
0	15	7
1	17	11
2	19	15
3	21	19
4	23	23
5	25	27

Solving linear systems by graphing:

If two lines intersect, the point of intersection represents a solution to both equations
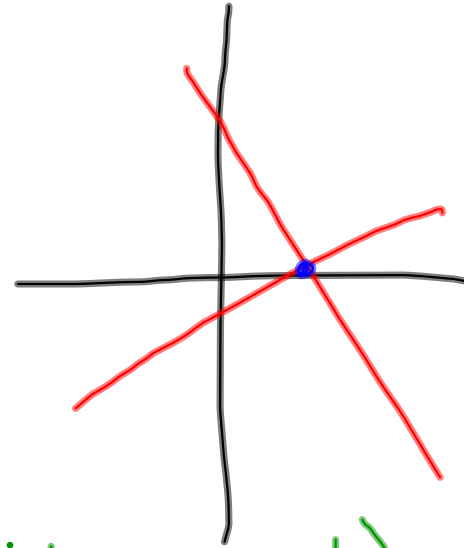
1. Graph both lines (put eq.'s into $y = mx + b$)

2. Estimate the point of intersection

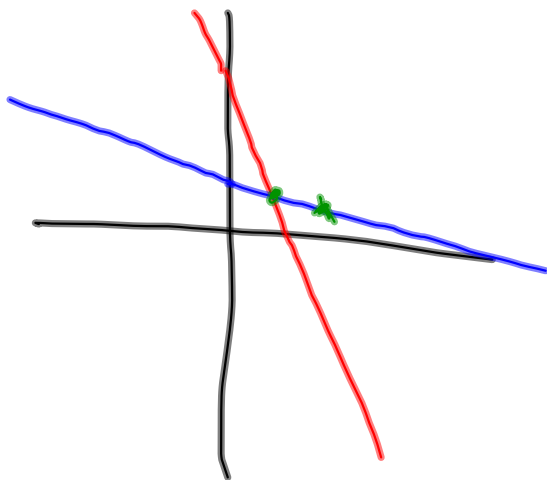**Tell whether the ordered pair is a solution of the linear system.**

1. (4, 1); not

$x + 2y = 6$ $y = -\frac{1}{2}x + 3$

$3x + y = 11$ $y = -3x + 11$

$4 + 2(1) = 6 \checkmark$

$3(4) + 1 = 11 \; \times$

2. (−2, 1); Yes

$5x - 2y = -12$

$x + 3y = 1$

$5(-2) - 2(1) = -12$

$-10 - 2 = -12 \checkmark$

$-2 + 3(1) = 1 \checkmark$

3. (4, −3); Yes
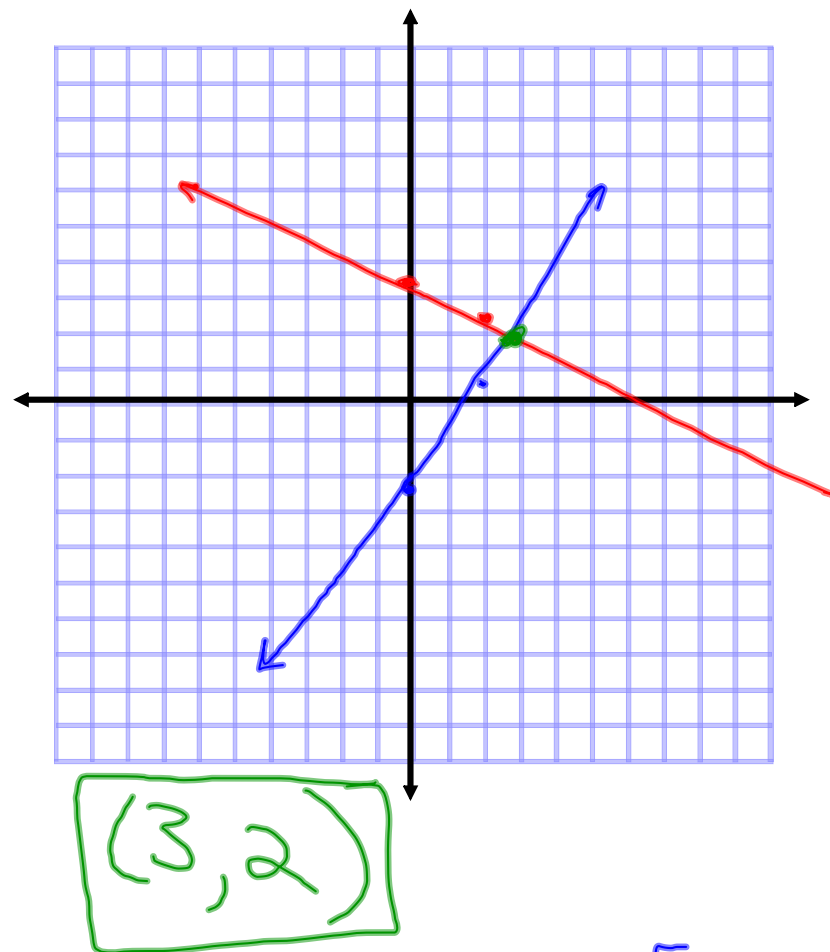
$-3x + 2y = -18$

$6x - y = 27$

$-3(4) + 2(-3) = -18$

$-12 - 6 = -18 \checkmark$

$6(4) - (-3) = 27$

$24 + 3 = 27 \checkmark$

$$x + 2y = 7$$

$$3x - 2y = 5$$

$$2y = -x + 7$$

$$y = -\frac{1}{2}x + \frac{7}{2}$$

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

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

$$(3, 2)$$

$$2 = -\frac{1}{2}(3) + \frac{7}{2}$$

$$\checkmark \quad 2 = -\frac{3}{2} + \frac{7}{2} = \frac{4}{2} = 2 \checkmark$$

$$2 = \frac{3}{2}(3) - \frac{5}{2}$$

$$\checkmark \quad 2 = \frac{9}{2} - \frac{5}{2} = \frac{4}{2} = 2 \checkmark$$

Use the graph to solve the linear system. Check your solution.
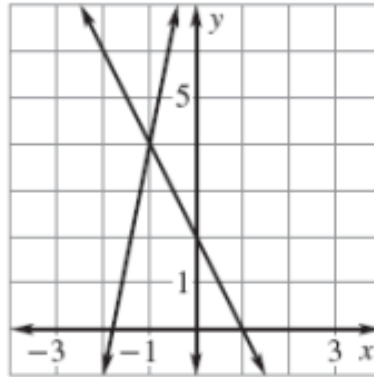
7. $x - y = 8$

$x + y = -2$
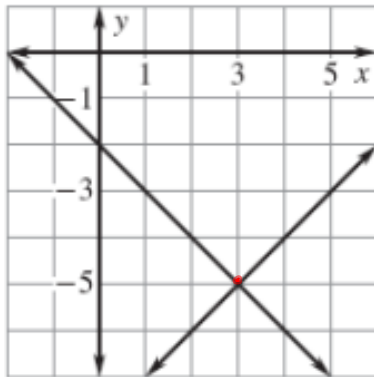
$(3, -5)$
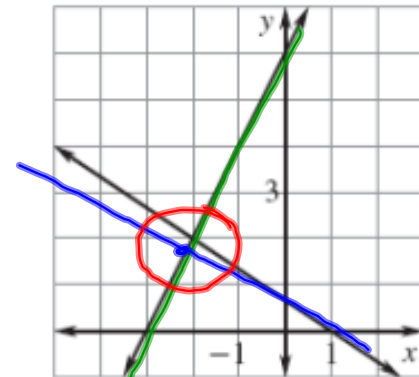
8. $5x - y = -9$

$y + 2x = 2$

$(-1, 4)$

9. $2x + 3y = 2$

$-2x + y = 6$
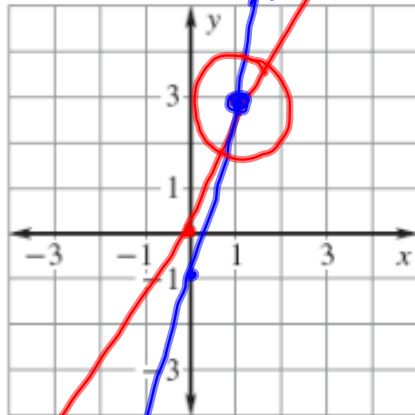
$(-2, 2)$

Solve the linear system by graphing. Check your solution.
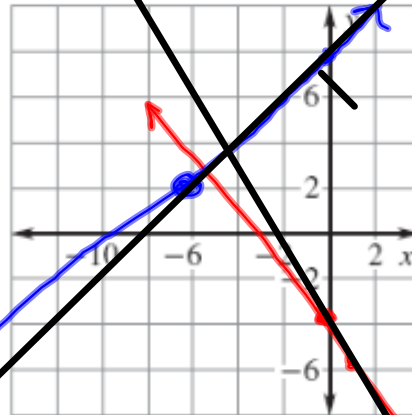
13. $y = 3x + 0$

$y = 4x - 1$

$(1, 3)$

$3 = 3(1)$ ✓

$3 = 4(1) - 1$

$= 3$ ✓

14. $2x + y = -4$
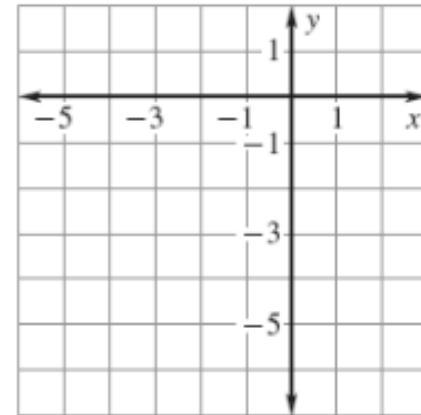
$x - y = -8$

$y = -2x - 4$

$-y = -x - 8$

$y = x + 8$

$(-4, 4)$

15. $-3x - y = -1$

$2x + 4y = -16$

p. 430, 4-16 (even), 31, 33