Review:

1. State the associative property for addition of real numbers.

$(a+b)+c = a+(b+c)$

2. Write the intersection in interval notation:

$\{x| -9 \leq x < 2\} \cap \{x| -3 < x < 9\}$

$(-3,2)$

3. Is it a function? {(2,3), (1,4), (3,1), (4,2), (1,2)} no
Why or why not? (1,4) & (1,2) have same x but different y

4. Given a line that passes through the points (-2,5) and (-3,1), find the equation of a line perpendicular to this line that passes through the point (6,2).

$m_1 = \frac{5-1}{-2+(+3)} = \frac{4}{1} = 4$ $\quad m_2 = -\frac{1}{4}$

$y-y_1 = m(x-x_1)$

$y-2 = -\frac{1}{4}(x-6)$

$y-2 = -\frac{1}{4}x + \frac{6}{4}$

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

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

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

3.5

26. (0,4) slope undefined

$x = 0$

3.6

19. (-5,0),(0,2) & (5,1),(0,-1)

$\frac{0-2}{-5-0} = \frac{2}{5}$ $\frac{1-(-1)}{5-0} = \frac{2}{5}$

Yes, parallel

Quiz #4 TOMORROW (Friday, 9/14) on linear functions (sections 3.1-3.6)

Test #2 NEXT WEDNESDAY (9/19)
emphasis on chapters 3 & 4, but will include some review problems! similar to old test #2, but will also include systems of linear equations (4.1,4.2)

Rather than taking the test in the 40-minute class period, we will take the test during the AHSGE morning break at **8:00 am**. We will meet for class during the regularly scheduled time that day (11:30-12:10).
***If you typically need a longer time to take tests, you may come at 8:45 when my 8:00 class is wrapping up their test. Please do not come early just for the sake of coming early, as there will not be enough desks.*

4.1 Solving Systems of Linear Equations
by Graphing and by the Substitution Method

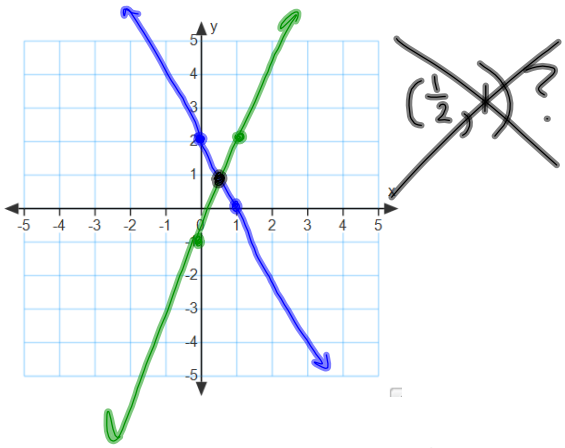
A system of equations is two or more equations considered together.

$$\begin{cases} Ax + By = C \\ Dx + Ey = F \end{cases}$$

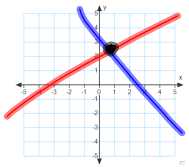
A solution of a system of equations in two variables is an ordered pair that is a solution of each equation in the system.

A solution of a system of linear equations can be found by graphing the lines of the system on the same coordinate axes. The point of intersection of the lines is the solution of the system of equations.

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

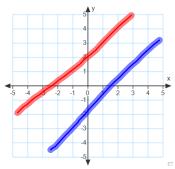


When the graphs intersect at only one point, the system of equations is called an **independent system of equations**.



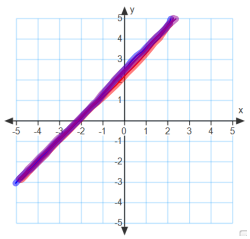
(x,y)

When the lines are parallel (and do not intersect), the system of equations is called an **inconsistent system of equations**, and has no solution.



no solution

When the two equations represent the same line, the system is called a **dependent system of equations**, and has infinitely many solutions of the form (x, mx+b).



(x, mx+b)

y=mx+b

Example 1

$$\begin{cases} y = 2x - 4 \\ y = -3x + 2 \end{cases}$$

$2x - 4 = -3x + 2$

$2x + 3x = 2 + 4$

$5x = 6$

$x = \frac{6}{5}$

$y = 2\left(\frac{6}{5}\right) - 4$

$y = \frac{12}{5} - \frac{20}{5}$

$y = \frac{-8}{5}$

$\left(\frac{6}{5}, \frac{-8}{5}\right)$

Example 2

$$\begin{cases} 2x + y = 4 \\ 3x - 2y = 5 \end{cases} \Rightarrow \begin{cases} y = -2x + 4 \\ 3x - 2y = 5 \end{cases}$$

$3x - 2(-2x + 4) = 5$

$3x + 4x - 8 = 5$

$7x = 13$

$x = \frac{13}{7}$

$y = -2\left(\frac{13}{7}\right) + 4$

$y = \frac{-26}{7} + \frac{28}{7}$

$y = \frac{2}{7}$

$\left(\frac{13}{7}, \frac{2}{7}\right)$

4.1

14. $\begin{cases} 2x + 3y = 6 \\ y = -\frac{2}{3}x + 1 \end{cases}$

$2x + 3\left(-\frac{2}{3}x + 1\right) = 6$

$2x - 2x + 3 = 6$ (parallel lines)

$3 = 6$ $\Rightarrow$ inconsistent system

no solution

16. $\begin{cases} 3x - 2y = 6 \\ y = \frac{3}{2}x - 3 \end{cases}$

$-2y = -3x + 6$

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

$3x = 2y + 6$

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

$3x - 2\left(\frac{3}{2}x - 3\right) = 6$

$3x - 3x + 6 = 6$

$6 = 6$

$\Rightarrow$ dependent system (infinitely many solutions)

$\left(x, \frac{3}{2}x - 3\right)$

$\left(\frac{2}{3}y + 2, y\right)$

Homework:

Solve by substitution even if directions say to solve by graphing.

4.1 # 13,15 ; 21-50