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, 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).

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

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

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

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

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

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

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

3.6

13. $x-4y=2$ & $4x+y=8$

$-4y=-x+2$ $\quad y=-4x+8$

$y=\frac{1}{4}x-\frac{1}{2}$ the lines are $\perp$ perpendicular

3.5

19. $(3,-4)$, slope undefined

$x=3$

45. $P_1(-2,5)$; $P_2(-2,-5)$

$x=-2$

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.

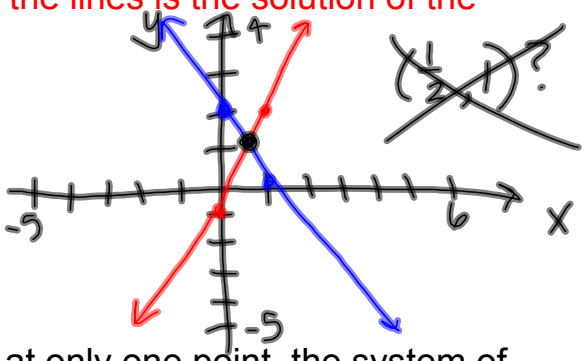
$$\begin{cases} Ax+By=C \\ Dx+Ey=F \end{cases}$$

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

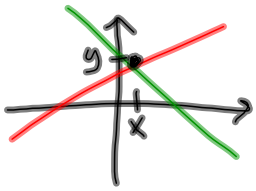
A solution of a system of linear equations can be found by graphing the lines of the system on the same coordinate axes. The point of intersection of the lines is the solution of the system of equations.

$y=3x-1$

$y=-2x+2$

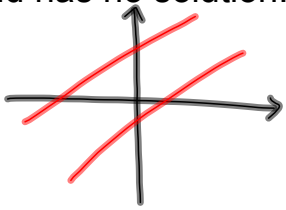


When the graphs intersect at only one point, the system of equations is called an independent system of equations.



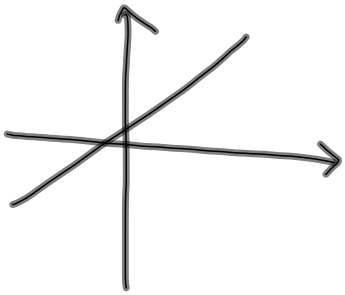
(x,y)

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).



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

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

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

$$5x = 6$$

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

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

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

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

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

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

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

$$3x + 4x - 8 = 5$$

$$7x = 13$$

$$x = 13/7$$

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

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

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

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

4.1

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

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

$2x-2x+3=6$

$3=6$ ↯ $\Rightarrow$ inconsistent system (parallel lines)

no solution

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16. $\begin{cases} 3x-2y=6 \\ y=\frac{3}{2}x-3 \end{cases}$ $\Rightarrow$ dependent system (same line)

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

$3x-3x+6=6$

$6=6$

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

Hw

solve by substitution
(even if directions say to solve by graphing)

4.1
#13, 15

#21-50