

Algebra 2/Trig Notes

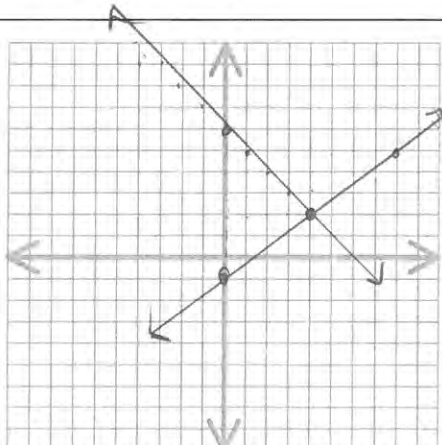
Name Key

3.1 Solve Linear Systems by Graphing

System of Equations: more than one equation

Example: $f(x) = -x + 6$

$$g(x) = \frac{3}{4}x - 1$$

<p>1. Is (5,1) a solution to $f(x)$?</p> $1 = -5 + 6$ $1 = 1 \quad \checkmark \quad \text{yes}$	<p>2. Is (5,1) a solution to $g(x)$?</p> $1 = \frac{3}{4}(5) - 1$ $1 = \frac{15}{4} - 1 \quad \text{NO}$
<p>3. Is (-8,-7) a solution to $f(x)$?</p> $-7 = -8 + 6$ $-7 \neq -2 \quad \text{NO}$	<p>4. Is (-8,-7) a solution to $g(x)$?</p> $-7 = \frac{3}{4}(-8) - 1$ $-7 = -6 - 1 \quad \checkmark \quad \text{yes}$
<p>5. Is (4,2) a solution to $f(x)$?</p> $2 = -4 + 6$ $2 = 2 \quad \checkmark \quad \text{yes}$	<p>6. Is (4,2) a solution to $g(x)$?</p> $2 = \frac{3}{4}(4) - 1$ $2 = 3 - 1 \quad \checkmark \quad \text{yes}$
<p>7. Graph $f(x)$ and $g(x)$. What do you notice about their solutions?</p> <p>(4,2) is the point of intersection and solves both equations.</p> 	

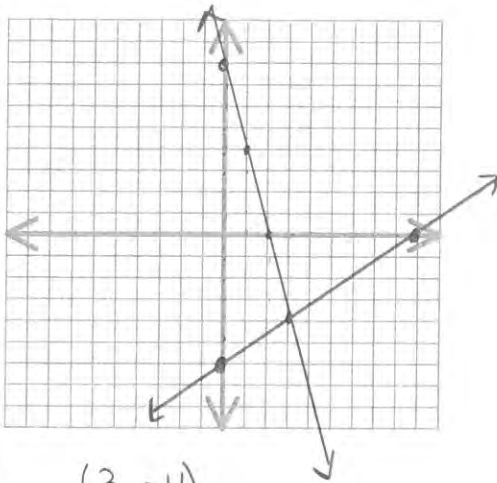
To Solve a System of Equations Graphically:

1. Graph each equation
2. The solution is the intersection of the lines.
 - This point will be the only point common to BOTH graphs.
3. Check your final solution in BOTH equations for accuracy!!
 - HOW?

Solve the system graphically. State the final solution on the blank.

1. $2x - 3y = 18$
 $y = -4x + 8$

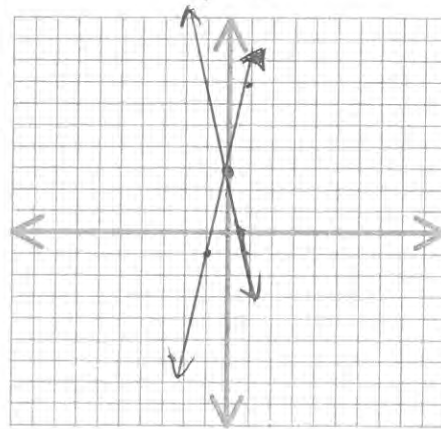
$$\begin{array}{r} x \ y \\ 0 \ 18 \\ 9 \ 0 \end{array}$$



1. (3, -4)

2. $12x - 3y = -9$
 $-4x + y = 3$
 $y = 4x + 3$

$$\begin{array}{r} x \ y \\ 0 \ -3/4 \\ 3 \ 0 \end{array}$$



2. (0, 3)

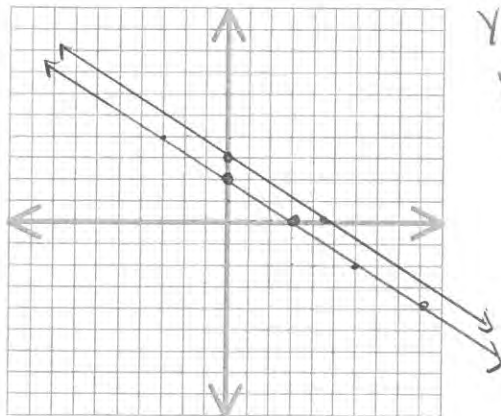
3. $4x + 6y = 18$
 $y = -\frac{2}{3}x + 2$

$$\begin{array}{r} x \ y \\ 0 \ 3 \\ 3 \ 0 \end{array}$$

$$6y = -4x + 18$$

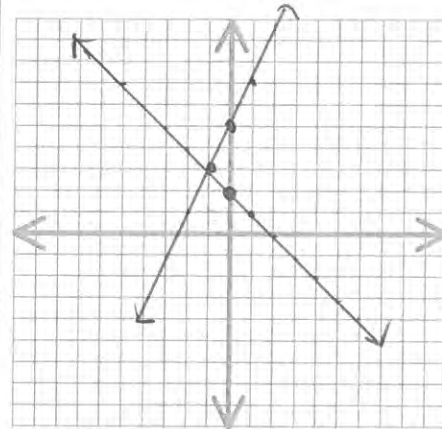
$$y = \frac{4}{6}x + 3$$

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



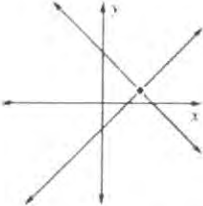
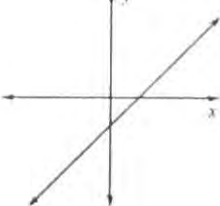
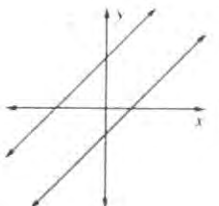
3. no solution

4. $-2x + y = 5$ $y = 2x + 5$
 $\frac{1}{2}y = -\frac{1}{2}x + 1$ $y = -x + 2$



4. (1, 3)

Summary- Types of Solutions of a Linear System:

Exactly One Solution	Infinitely Many Solutions	No Solution
		
<p>Lines Intersect at One Point (x, y)</p>	<p>Lines Coincide Write solution as the equation of the line in slope-intercept form</p>	<p>Lines are Parallel No solution or \emptyset</p>

3.3 Graph Systems of Linear Inequalities

To Graph Systems of Inequalities:

1. Graph each inequality on the same coordinate plane. *Shade lightly!*
2. The solution is the *intersection* of the shaded regions.

Examples:

1. $x \geq 5$ — solid
 $x + y \leq 3$ — solid

TEST
 $(0, 9)$
 $0 + 9 \leq 3$ ✓

Is $(5, -2)$ a solution to the system?
yes

Is $(51, -96)$ a solution to the system?
yes
 $51 + (-96) \leq 3$

2. --- $4x + 5y \leq -20$
 --- $4x + 5y > 10$

TEST $6 + 0 < -20$ no
 $0 + 0 > 10$ no

What would be the solution to:
 $4x + 5y > -20$
 $4x + 5y < 10$
 the area between the lines
no solution

3. $y \leq 7$
 $y > -x - 1$
 $y > x + 5$

TEST
 $0 > 0 - 1$ yes
 $0 > 5$ no

4. $x - y \leq 7$
 $x + y < 7$
 $x > 2$

TEST $2 < -2 + 7$ ✓
 $2 < 2 - 7$ ✗
 $2 < -2 + 7$ ✓