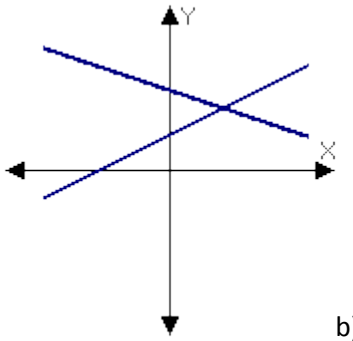
Review Exercise Set 20

Exercise 1: Determine if the ordered pair (2, 3) is a solution to the given system of equations.

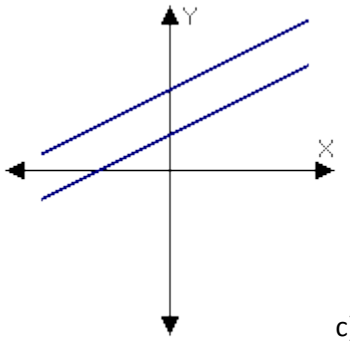
$2y = x + 4$
$6y - 27 = -2x$

Exercise 2: Label the following graphs below as being an example of a consistent, inconsistent, or dependent system of equations.

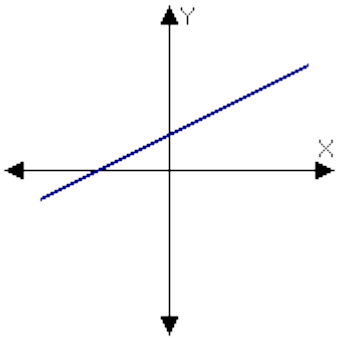
a)



b)



c)

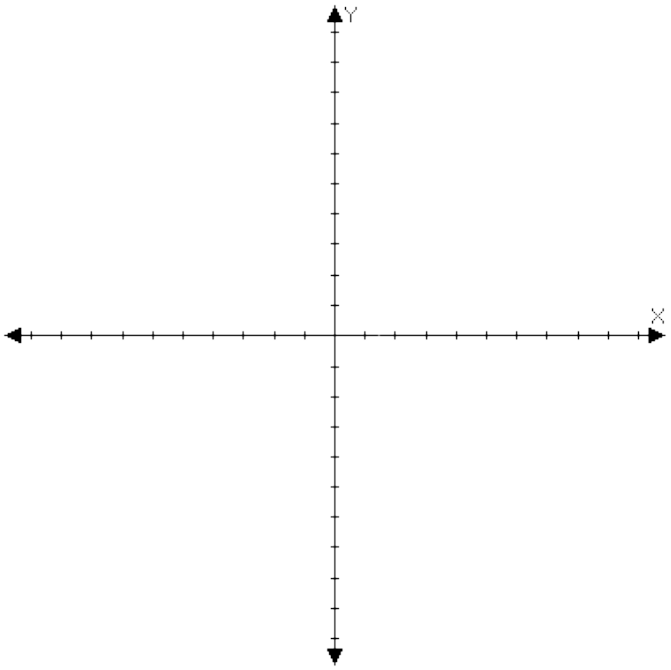


Exercise 3: Rewrite each equation in slope-intercept form and then state whether the system has exactly one solution, no solution, or infinite solutions.

$4x + 7y = 2$
$9x - 2y = 1$

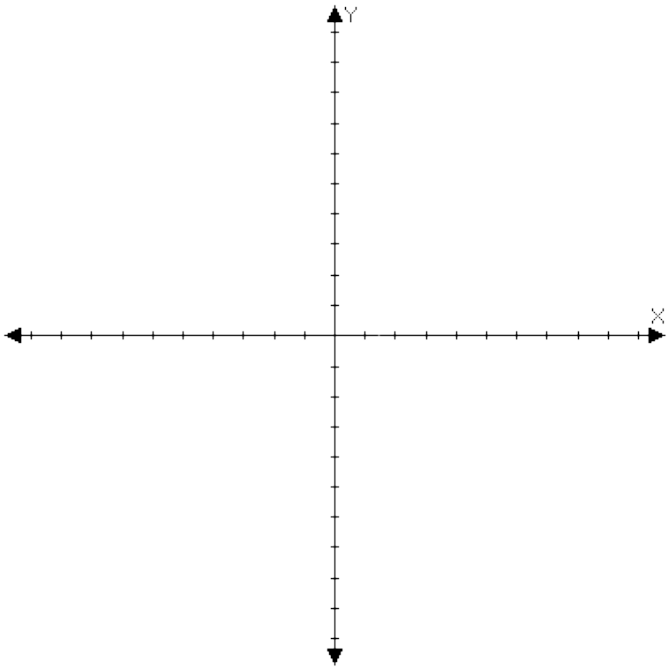
Exercise 4: Determine the solution of the following system of equations graphically.

$5x + 2y = -9$
$4x - 3y = 2$



Exercise 5: Determine the solution of the following system of equations graphically.

$3x - 2y = 9$
$7y - 5x = 7$



Review Exercise Set 20 Answer Key

Exercise 1: Determine if the ordered pair (2, 3) is a solution to the given system of equations.

$2y = x + 4$
$6y - 27 = -2x$

Substitute the ordered pair into the first equation

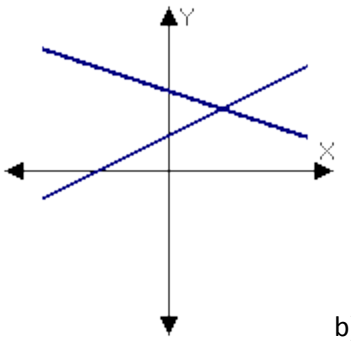
$2y = x + 4$
$2(3) = (2) + 4$
$6 = 6$
True

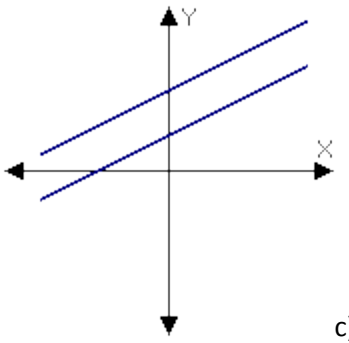
Substitute the ordered pair into the second equation

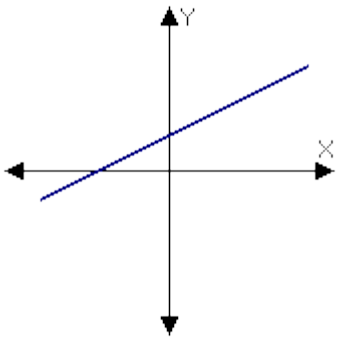
$6y - 27 = -2x$
$6(3) - 27 = -2(2)$
$18 - 27 = -4$
$-9 = -4$
False

The ordered pair (2, 3) does not satisfy both equations so it is not a solution for the system of equations.

Exercise 2: Label the following graphs below as being an example of a consistent, inconsistent, or dependent system of equations.

a) 

b) 

c) 

Graph a - consistent (the lines intersect at a single point)

Graph b - inconsistent (the lines do not intersect at all)

Graph c - dependent (the lines are the same)

Exercise 3: Rewrite each equation in slope-intercept form and then state whether the system has exactly one solution, no solution, or infinite solutions.

4x + 7y = 2
9x - 2y = 1

Rewrite the equations

$$4x+7y=2 \qquad 9x-2y=1$$
$$7y=-4x+2 \qquad -2y=-9x+1$$
$$y=-\frac{4}{7}x+\frac{2}{7} \qquad y=\frac{9}{2}x-\frac{1}{2}$$

Compare the equations and the slopes of the two lines

$$y=-\frac{4}{7}x+\frac{2}{7};\quad m=-\frac{4}{7} \qquad y=\frac{9}{2}x-\frac{1}{2};\quad m=\frac{9}{2}$$

The slopes are not equal so the system cannot be inconsistent (no solution)

The two equations are not the same so the system cannot be dependent (infinite solutions)

Since the slopes of the two lines have opposite signs they will intersect at a single point, so this system is consistent (exactly one solution).

Exercise 4: Determine the solution of the following system of equations graphically.

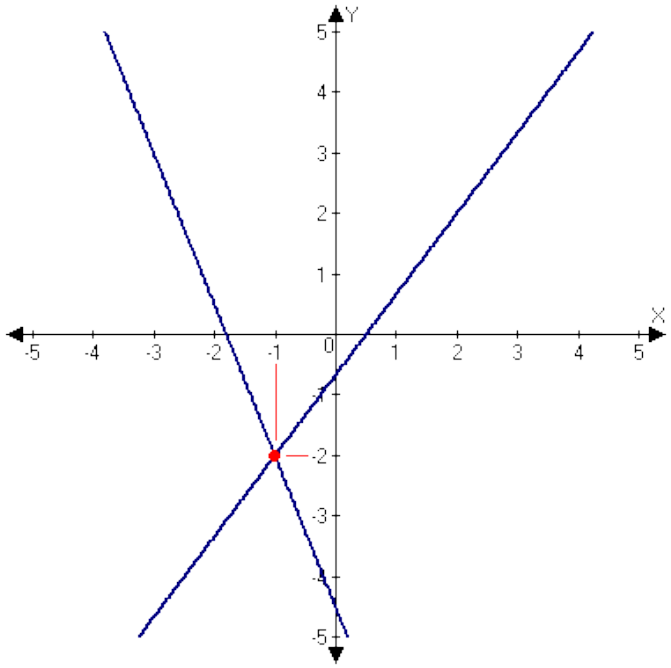
5x + 2y = -9
4x - 3y = 2

Rewrite the equations in slope-intercept form

$$5x+2y=-9 \qquad 4x-3y=2$$
$$2y=-5x-9 \qquad -3y=-4x+2$$
$$y=-\frac{5}{2}x-\frac{9}{2} \qquad y=\frac{4}{3}x-\frac{2}{3}$$

Exercise 4 (Continued):

Graph the lines and find the point of intersection



From the graph we can see that the lines intersect at (-1, -2) so this is the solution for the system of equations.

Exercise 5: Determine the solution of the following system of equations graphically.

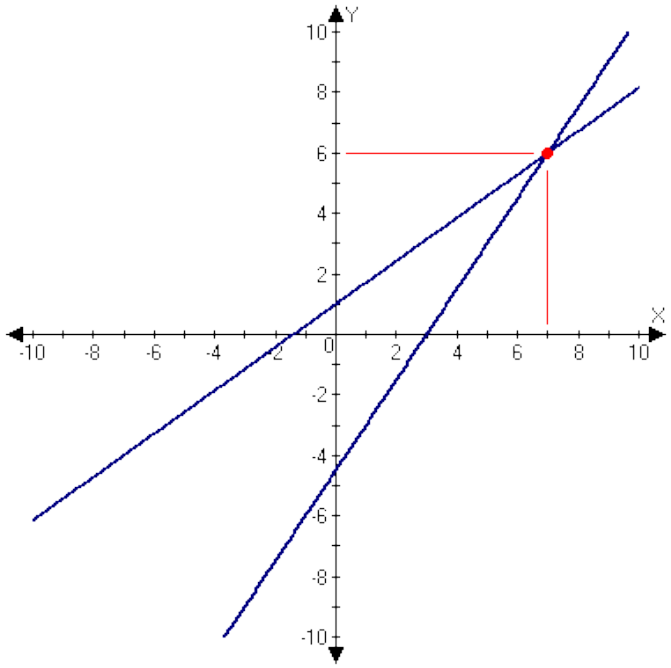
3x - 2y = 9
7y - 5x = 7

Rewrite the equations in slope-intercept form

$$3x-2y=9 \qquad 7y-5x=7$$
$$-2y=-3x+9 \qquad 7y=5x+7$$
$$y=\frac{3}{2}x-\frac{9}{2} \qquad y=\frac{5}{7}x+1$$

Exercise 5 (Continued):

Graph the lines and find the point of intersection



From the graph we can see that the lines intersect at (7, 6) so this is the solution for the system of equations.