

11/27 Algebra - Downing

Warm-up

Tell whether the ordered pair is a solution to the equation

Ex) $(-2, 3)$ $y = -2x - 1$

$$3 = -2(-2) - 1$$

$$3 = 4 - 1$$

$$3 = 3 \checkmark$$

yes

Ex) $(3, 2)$ $x + 6y = 13$

$$3 + 6(2) = 13$$

$$3 + 12 = 13$$

$$15 \neq 13$$

No

* Infinite Solutions
(same line)

5.1 Systems of Equations

System of linear equations is a set of 2 (or more) linear equations with the same variables.

* No Solutions
(parallel lines)

Solution of a system - an ordered pair that is a solution of each equation in the system.

* One Solution
(when lines intersect)

Ex) Tell whether the ordered pair is a solution of the system.

$$(2, 5) \begin{cases} x + y = 7 \\ 2x - 3y = -11 \end{cases}$$

plug in
 $x=2$ $y=5$

$$2 + 5 = 7$$

$$7 = 7 \checkmark$$

$$2(2) - 3(5) = -11$$

$$4 - 15 = -11$$

$$-11 = -11 \checkmark$$

$(2, 5)$ is a solution

Ex) $(-2, 0)$ $\begin{cases} y = -2x - 4 \\ y = x + 4 \end{cases}$

plug in
 $x = -2$ $y = 0$

$$0 = -2(-2) - 4 \quad 0 = -2 + 4$$

$$0 = 4 - 4 \quad 0 = 2$$

$$0 = 0 \checkmark$$

No

$(-2, 0)$ is not a solution

Solving a System of Linear Equations by Graphing

1. Graph each equation in the same coordinate plane
2. Find the point of intersection
3. Check the point from step 2 by substituting for x and y in each equation of the original system.

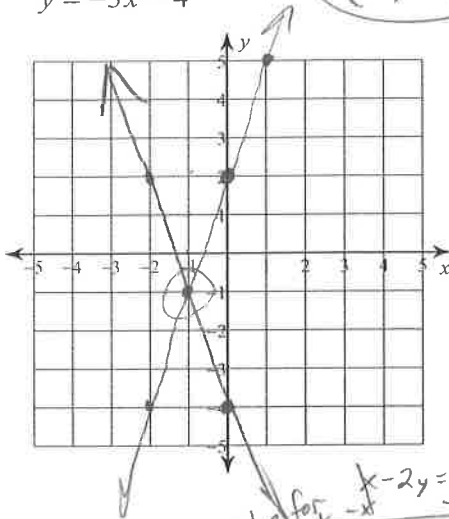
Notes Worksheet

HW - p. 239 # 4-7, 10, 11, 13-18
28

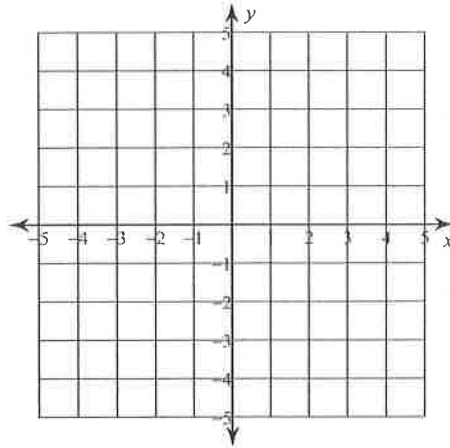
Solve each system by graphing.

1) $y = 3x + 2$
 $y = -3x - 4$

$(-1, -1)$

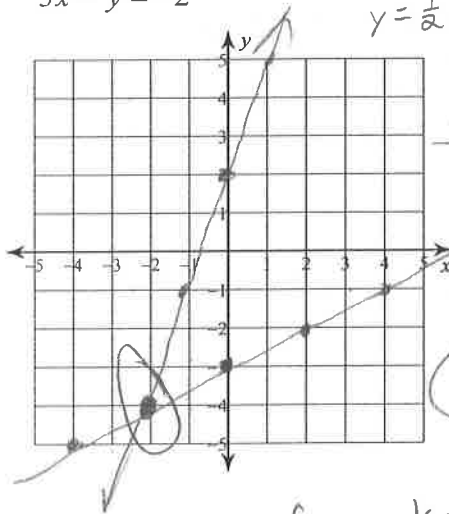


2) $y = -2x - 3$
 $y = 4x + 3$

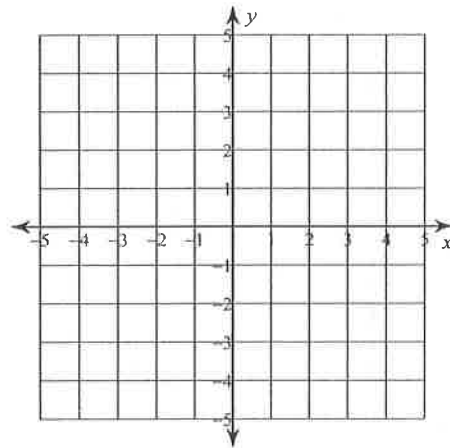


3) $x - 2y = 6$
 $3x - y = -2$

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

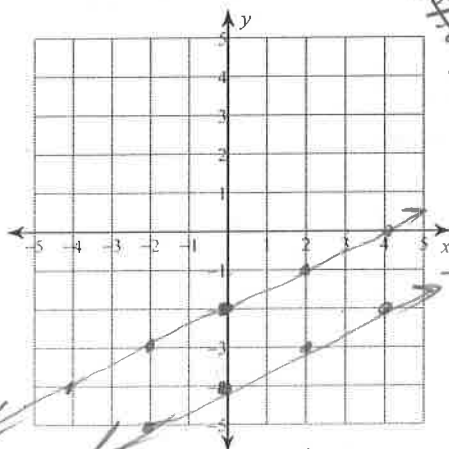


4) $x + 2y = 8$
 $5x - 2y = 4$



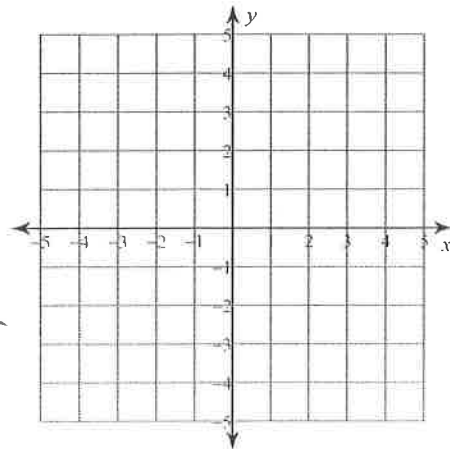
5) $x - 2y = 8$
 $x - 2y = 4$

Solve for y first
 $x - 2y = 8$
 $-x$
 $\frac{-2y}{-2} = \frac{-x+8}{-2}$
 $y = \frac{1}{2}x - 4$



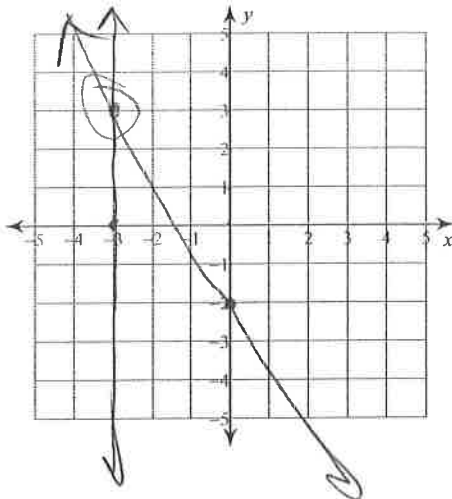
No Solution
Parallel Lines

6) $2x + 3y = -9$
 $2x + 3y = 3$

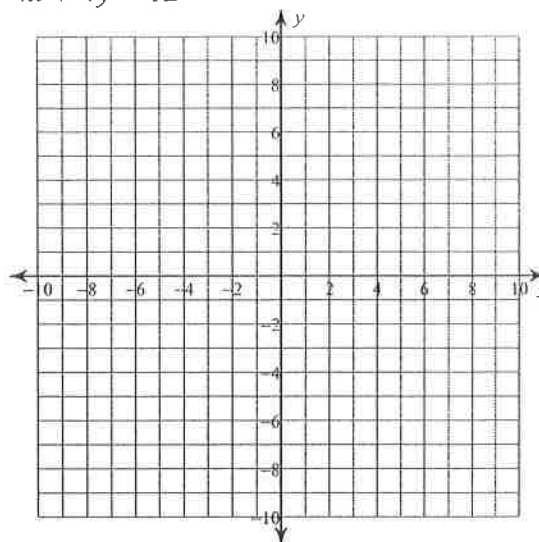


7) $x = -3$
 $y = -\frac{5}{3}x - 2$

$(-3, 3)$

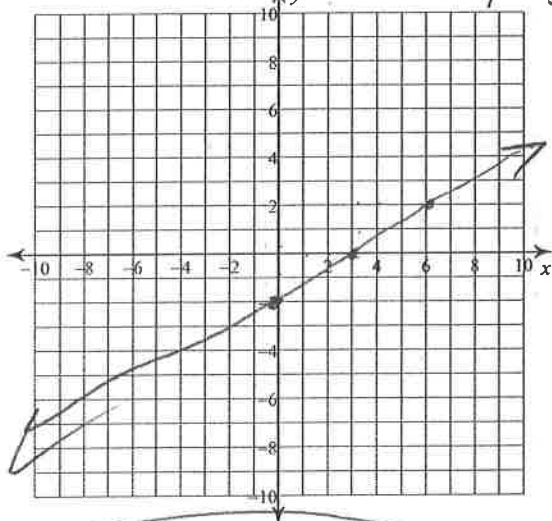


8) $y = -x + 3$
 $4x + 4y = 12$



9) $y = \frac{2}{3}x - 2$
 $4x - 6y = 12$

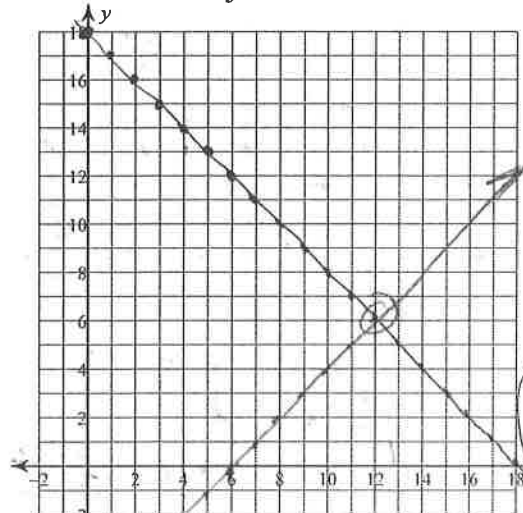
$\frac{4x - 6y = 12}{-4x} \quad \frac{-6y = -4x + 12}{-6}$
 $y = \frac{2}{3}x - 2$



Infinite Solutions

Lines are on top of each other

10) You have a total of 18 math and science exercises for homework. You have six more math exercises than science exercises. How many exercises do you have in each subject?



$(12, 6)$
 12 math exercises
 6 science questions

$x = \text{math exercises}$
 $y = \text{science exercises}$

$$\begin{array}{r} x + y = 18 \\ -x = -x \\ \hline y = -x + 18 \end{array}$$

$y = x - 6$