

From

RR 17

Note Title

2/5/2015

Review : $2x - y = 8$

$x=0$

$$2(0) - y = 8$$

$$0 - y = 8$$

$$-y = 8$$

$$\frac{-y}{-1} = \frac{8}{-1}$$

$$y = -8$$

$$(0, -8)$$

x	y
0	-8
-1	-10
2	-4
	-8
	2

$x=-1$

$$2(-1) - y = 8$$

$$-2 - y = 8$$

$$+2 \quad +2$$

$$-y = 10$$

$$\frac{-y}{-1} = \frac{10}{-1}$$

$$y = -10$$

$$(-1, -10)$$

$x=2$

$$2x - y = 8$$

$$2(2) - y = 8$$

$$4 - y = 8$$

$$-1 \quad -1$$

$$-y = 4$$

$$\frac{-y}{-1} = \frac{4}{-1}$$

$$y = -4$$

$$(2, -4)$$

$y=-6$

$$2x - y = 8$$

$$2x - (-6) = 8$$

$$2x + 6 = 8$$

$$-6 \quad -6$$

$$2x = 2$$

$$\frac{2x}{2} = \frac{2}{2}$$

$$x = 1$$

$$(1, -6)$$

$y=2$

$$2x - 2 = 8$$

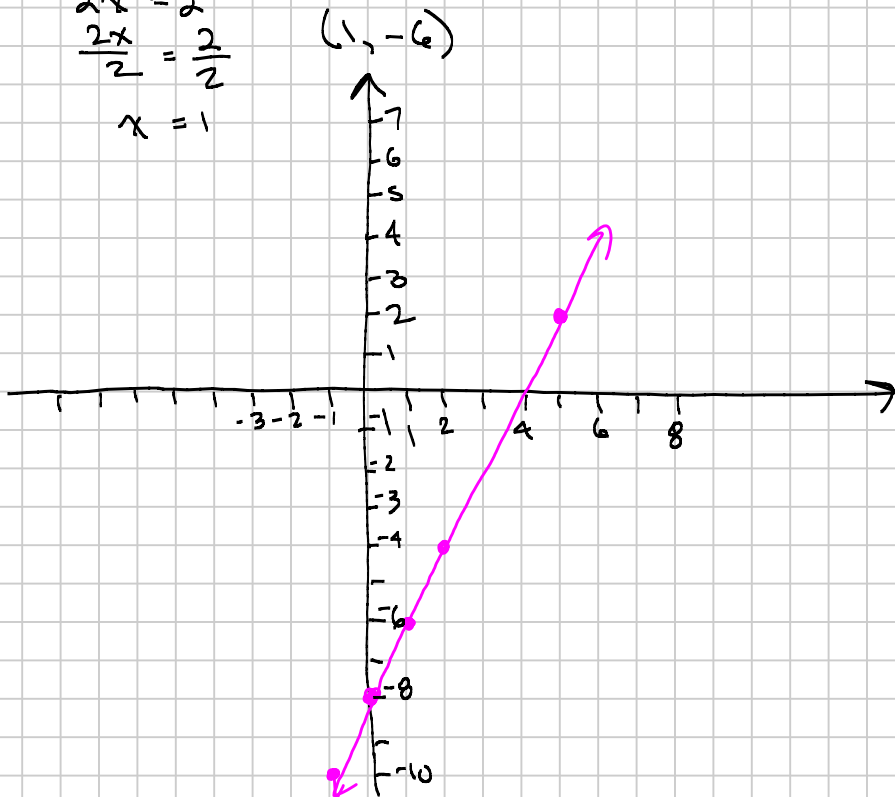
$$+2 \quad +2$$

$$2x = 10$$

$$\frac{2x}{2} = \frac{10}{2}$$

$$x = 5$$

$$(5, 2)$$



3.2: Linear equations in two variables (cont'd)

3.2.4

Example: Find at least 5 ordered pair solutions.
Graph the line.

$$x - 2y = -6$$

Points:

$$(-6, 0)$$

$$(-2, 2)$$

$$(8, 7)$$

$$(6, 6)$$

$$(2, 4)$$

$$(-3, 1\frac{1}{2})$$

$$(10, 8)$$

$$(-10, -2)$$

$$(0, 3)$$

$$(4, 5)$$

$$x = 8$$

$$x - 2y = -6$$

$$8 - 2y = -6$$

$$-8$$

$$-2y = -14$$

$$\frac{-2y}{-2} = \frac{-14}{-2}$$

$$y = 7 \quad (8, 7)$$

$$x = -3 \quad -3 - 2y = -6$$

$$+3$$

$$+3$$

$$-2y = -3$$

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

$$y = \frac{3}{2} = 1\frac{1}{2}$$

Ex: Solve the equation for y first.
Then find solutions and graph.

$$6x + 2y = -10$$

$$-6x$$

$$-6x$$

$$2y = -10 - 6x$$

$$\frac{2y}{2} = \frac{-10}{2} - \frac{6x}{2}$$

$$y = -5 - 3x$$

See next page for graph

$$y = -5 - 3x$$

$$-3 \quad y = -5 - 3(-3) = -5 + 9 = 4 \quad (-3, 4)$$

$$-2 \quad y = -5 - 3(-2) = -5 + 6 = 1 \quad (-2, 1)$$

$$-1 \quad y = -5 - 3(-1) = -5 + 3 = -2 \quad (-1, -2)$$

$$0 \quad y = -5 - 3(0) = -5 - 0 = -5 \quad (0, -5)$$

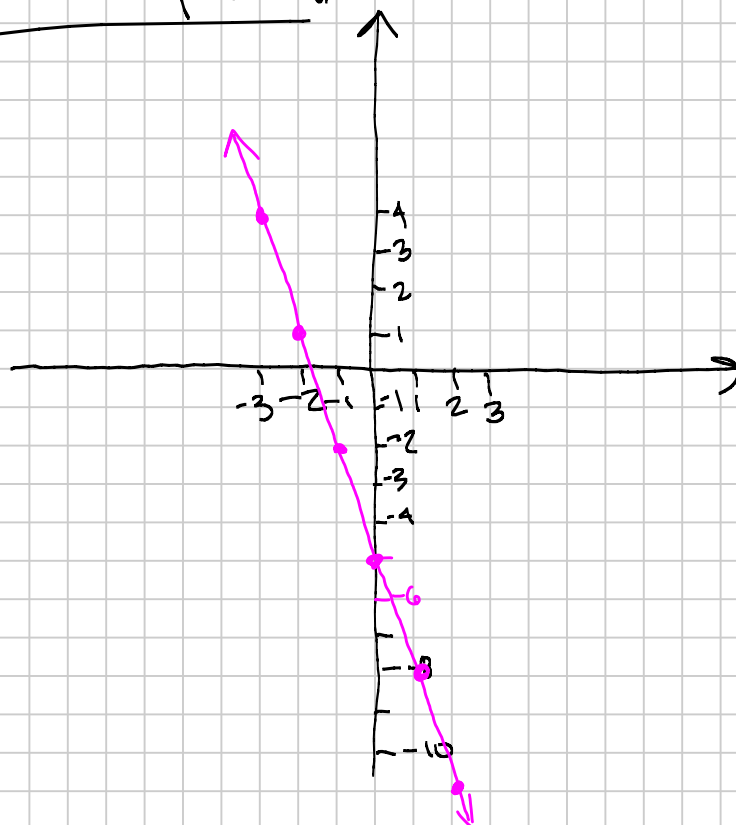
$$1 \quad y = -5 - 3(1) = -5 - 3 = -8 \quad (1, -8)$$

$$2 \quad y = -5 - 3(2) = -5 - 6 = -11 \quad (2, -11)$$

$$3 \quad y = -5 - 3(3) = -5 - 9 = -14 \quad (3, -14)$$

Previous example cont'd:

3.2.5

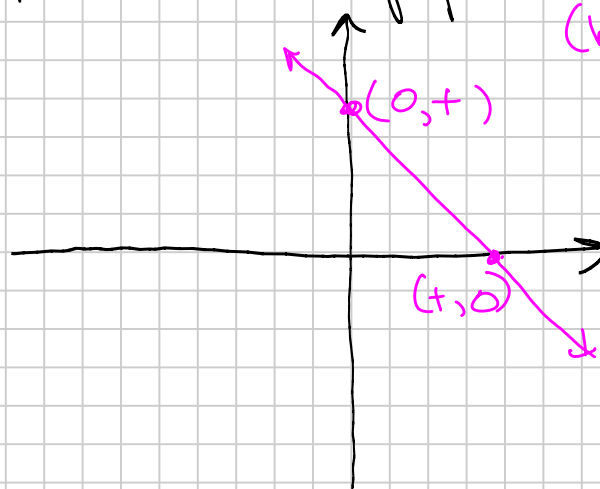


$(-3, 4)$
 $(-2, 1)$
 $(-1, -2)$
 $(0, -5)$
 $(1, -8)$
 $(2, -11)$
 $(3, -14)$

Intercepts:

x-intercept: a point where the graph intersects the x-axis.
(has the form $(a, 0)$ or just a)

y-intercept: a point where the graph intersects the y-axis.
(has the form $(0, b)$ or just b)



How to find intercepts:

* To find the x-intercept, set $y = 0$ and solve for x .

* To find the y-intercept, set $x = 0$ and solve for y .

Ex. Find the intercepts and graph the line.

3.2.6

$$4x - y = 20$$

Find the x-intercept: Set $y = 0$:

$$4x - 0 = 20$$

$$4x = 20$$

$$\frac{4x}{4} = \frac{20}{4}$$

$$x = 5 \quad (5, 0)$$

Find y-intercept:

$$\text{Set } x = 0: 4(0) - y = 20$$

$$0 - y = 20$$

$$-y = 20$$

$$\frac{-y}{-1} = \frac{20}{-1}$$

$$y = -20$$

$$(0, -20)$$

The x-intercept is $(5, 0)$. (or just 5).

The y-intercept is $(0, -20)$. (or just -20)

Find an extra point:

$x = 2$

$$4x - y = 20$$

$$4(2) - y = 20$$

$$8 - y = 20$$

$$\begin{matrix} -8 & -8 \end{matrix}$$

$$-y = 12$$

$$y = -12$$

$$(2, -12)$$

$x = 9$

$$4(9) - y = 20$$

$$36 - y = 20$$

$$\begin{matrix} -36 & -36 \end{matrix}$$

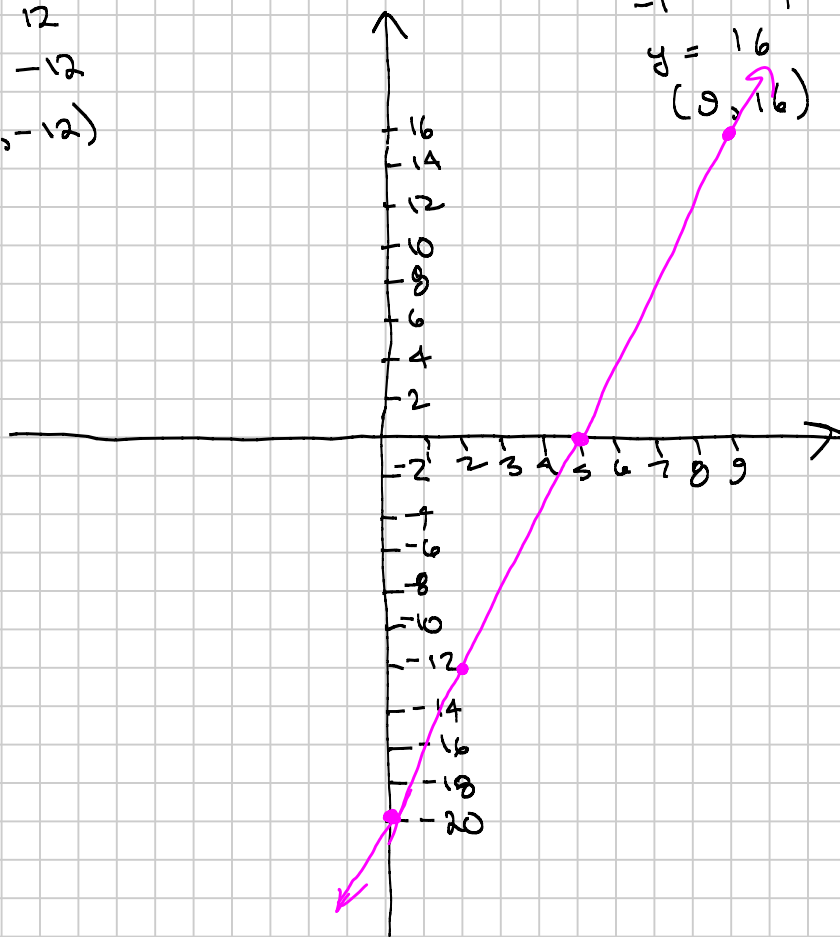
$$-y = -16$$

$$\frac{-y}{-1} = \frac{-16}{-1}$$

$$y = 16$$

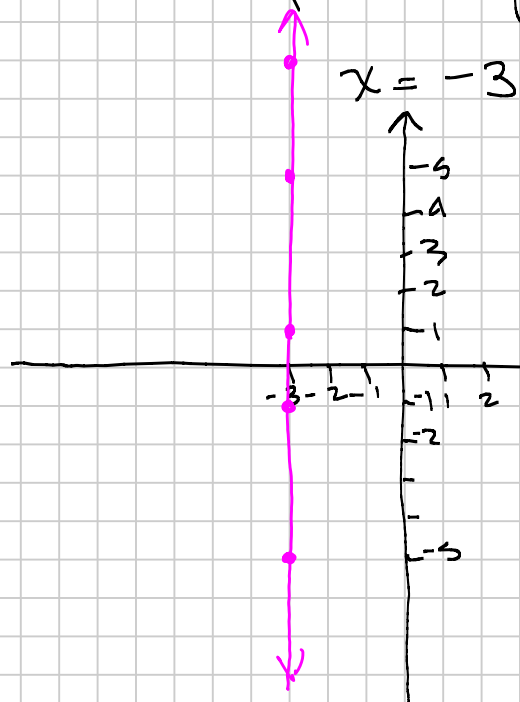
$$(9, 16)$$

Intercepts: $(0, -20)$
 $(5, 0)$



(3.2.7)

Ex: Graph the equation.



$$(-3, 1)$$

$$(-3, 100)$$

$$(-3, 5)$$

$$(-3, 8)$$

$$(-3, -1)$$

$$(-3, -5)$$

This is a vertical line.

The x-intercept is -3 or $(-3, 0)$.
There is no y-intercept.

Ex: Graph the equation.

$$y = 6$$

$$(-6, 6)$$

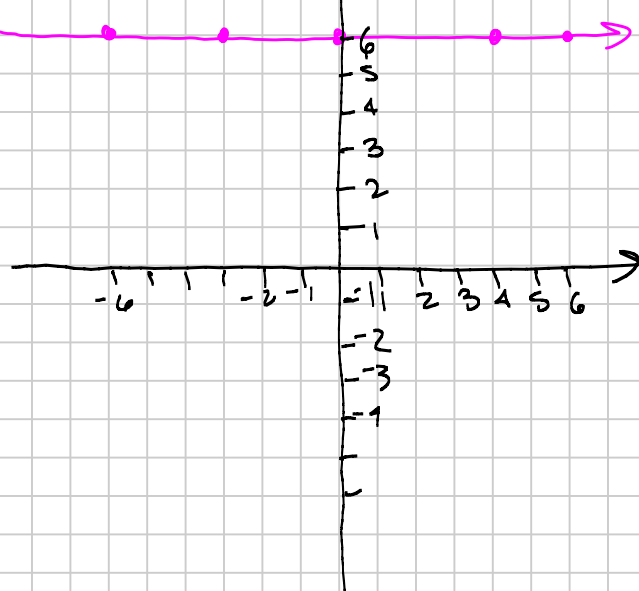
$$(-10, 6)$$

$$(-3, 6)$$

$$(4, 6)$$

$$(6, 6)$$

$$(0, 6)$$



This is a horizontal line.

The x-intercept does not exist
(there is no x-intercept)

The y-intercept is 6 or $(0, 6)$.