

Lesson 5-2

Objective - To graph horizontal, vertical, and oblique lines using intercepts.

Linear Equations ?

x	y = 2x + 1
-2	2(-2) + 1 = -3
-1	2(-1) + 1 = -1
0	2(0) + 1 = 1
1	2(1) + 1 = 3
2	2(2) + 1 = 5
3	2(3) + 1 = 7
4	2(4) + 1 = 9
$\frac{1}{2}$	$2(\frac{1}{2}) + 1 = 2$

Write the equation in function form, complete the table, and graph.

$$\begin{array}{r} 3x + 2y = -4 \\ -3x \quad -3x \\ \hline 2y = -3x - 4 \\ \frac{2y}{2} = \frac{-3x - 4}{2} \\ y = \frac{-3x}{2} - \frac{4}{2} \\ y = \frac{-3}{2}x - 2 \end{array}$$

x	y = $\frac{-3}{2}x - 2$
-6	$\frac{-3}{2}(-6) - 2 = 7$
-4	$\frac{-3}{2}(-4) - 2 = 4$
-2	$\frac{-3}{2}(-2) - 2 = 1$
0	$\frac{-3}{2}(0) - 2 = -2$
2	$\frac{-3}{2}(2) - 2 = -5$

Write the equation in function form, complete the table, and graph.

x	y = $\frac{-3}{2}x - 2$
-6	$\frac{-3}{2}(-6) - 2 = 7$
-4	$\frac{-3}{2}(-4) - 2 = 4$
-2	$\frac{-3}{2}(-2) - 2 = 1$
0	$\frac{-3}{2}(0) - 2 = -2$
2	$\frac{-3}{2}(2) - 2 = -5$

Write the equation in function form, make a table, and graph.

$$\begin{array}{r} x - 3y = 6 \\ -x \quad -x \\ \hline -3y = -x + 6 \\ \frac{-3y}{-3} = \frac{-x + 6}{-3} \\ y = \frac{-x}{-3} + \frac{6}{-3} \\ y = \frac{1}{3}x - 2 \end{array}$$

x	y = $\frac{1}{3}x - 2$
-6	$\frac{1}{3}(-6) - 2 = -4$
-3	$\frac{1}{3}(-3) - 2 = -3$
0	$\frac{1}{3}(0) - 2 = -2$
3	$\frac{1}{3}(3) - 2 = -1$
6	$\frac{1}{3}(6) - 2 = 0$

Write the equation in function form, complete the table, and graph.

x	y = $\frac{1}{3}x - 2$
-6	$\frac{1}{3}(-6) - 2 = -4$
-3	$\frac{1}{3}(-3) - 2 = -3$
0	$\frac{1}{3}(0) - 2 = -2$
3	$\frac{1}{3}(3) - 2 = -1$
6	$\frac{1}{3}(6) - 2 = 0$

Graphing Using Intercepts

Graph $x + y = 5$

x-intercept
(5, 0)

y-intercept
(0, 5)

Lesson 5-2 (cont.)

Finding Intercepts

x-intercept = where the line crosses the x-axis
 y-intercept = where the line crosses the y-axis

Oblique
 $y = 2x + 3$

x	y
-3	-3
-2	-1
-1	1
0	3
1	5
2	7

x-intercept (set $y = 0$)
 $y = 2x + 3$
 $0 = 2x + 3$
 $-3 = 2x$
 $\frac{-3}{2} = \frac{2x}{2}$
 $x = -\frac{3}{2}$

y-intercept (set $x = 0$)
 $y = 2x + 3$
 $y = 2(0) + 3$
 $y = 3$

Find the x-intercept and y-intercept.

1) $4x + 2y = 6$

	<u>x-intercept</u>	<u>y-intercept</u>
(Set $y = 0$)	(Set $x = 0$)	
$4x + 2y = 6$	$4x + 2y = 6$	
$4x + 2(0) = 6$	$4(0) + 2y = 6$	
$\frac{4x}{4} = \frac{6}{4}$	$\frac{2y}{2} = \frac{6}{2}$	
$x = \frac{6}{4}$	$y = 3$	
$x = \frac{3}{2}$		

Find the x-intercept and y-intercept.

2) $3x - y = -5$

	<u>x-intercept</u>	<u>y-intercept</u>
(Set $y = 0$)	(Set $x = 0$)	
$3x - y = -5$	$3x - y = -5$	
$3x - (0) = -5$	$3(0) - y = -5$	
$\frac{3x}{3} = \frac{-5}{3}$	$-y = -5$	
$x = -\frac{5}{3}$	$-1(-y = -5)$	
	$y = 5$	

Graph using the x-intercept and y-intercept.

$2x - 3y = 8$

x-intercept (Set $y = 0$)
 $2x - 3(0) = 8$
 $\frac{2x}{2} = \frac{8}{2}$
 $x = 4$
 or $(4, 0)$

y-intercept (Set $x = 0$)
 $2(0) - 3y = 8$
 $\frac{-3y}{-3} = \frac{8}{-3}$
 $y = -2\frac{2}{3}$
 or $(0, -2\frac{2}{3})$

Graph using the x-intercept and y-intercept.

$3x + 5y = 150$

x-intercept (Set $y = 0$)
 $3x + 5(0) = 150$
 $\frac{3x}{3} = \frac{150}{3}$
 $x = 50$
 or $(50, 0)$

y-intercept (Set $x = 0$)
 $3(0) + 5y = 150$
 $\frac{5y}{5} = \frac{150}{5}$
 $y = 30$
 or $(0, 30)$

Finding Intercepts

x-intercept = where the line crosses the x-axis
 y-intercept = where the line crosses the y-axis

<u>Horizontal</u>	<u>Vertical</u>
$y = 2$	$x = -1$
x-int. = none	x-int. = -1
y-int. = 2	y-int. = none

Lesson 5-2 (cont.)

Find the x-intercept and y-intercept.

	<u>x-intercept</u>	<u>y-intercept</u>
1) $x = 5$	$x = 5$ or $(5,0)$	none
2) $y = -\frac{3}{2}$	none	$(0, -\frac{3}{2})$
3) $x = -1$	$(-1,0)$	none

Find the x-intercept and y-intercept.

	<u>x-intercept</u>	<u>y-intercept</u>
4) $x = -3$	$x = -3$ or $(-3,0)$	none
5) $y = -1$	none	$(0, -1)$
6) $x = 0$	$(0,0)$	y-axis