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3-1 *(continued)* Graphing Linear Equations using intercepts.

x-intercept: x value where the line crosses the x axis (x, 0)

y-intercept: y value where the line crosses the y axis (0, y)

Example 1: Graph $3x + 2y = 6$ by using the x- and y-intercepts.

x int: $3x + 2(0) = 6$

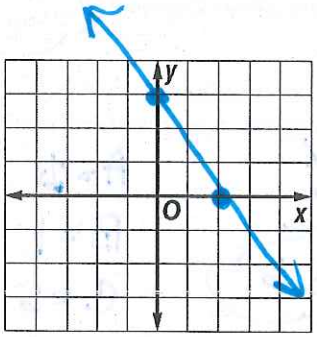
$\frac{3}{3}x = \frac{6}{3}$

$x = 2$

y int: $3(0) + 2y = 6$

$\frac{2y}{2} = \frac{6}{2}$

$y = 3$



x	y
0	3
2	0

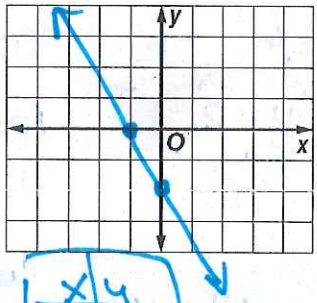
*

Graph each equation by using the x– and y-intercepts.

1. $2x + y = -2$

x int: $2x + 0 = -2$, $x = -2$, $x = -1$

y int: $2(0) + y = 2$, $y = -2$

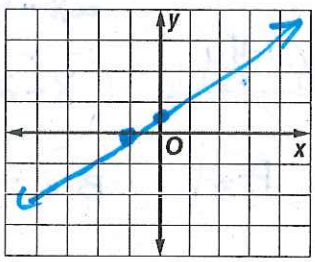


x	y
-1	0
0	-2

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

x int: $3x - 6(0) = -3$, $3x = -3$, $x = -1$

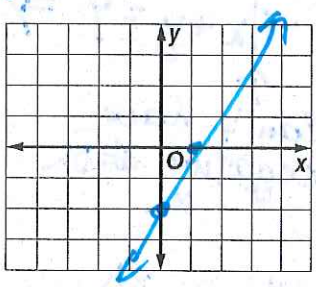
y int: $3(0) - 6y = -3$, $-6y = -3$, $\frac{-6y}{-6} = \frac{-3}{-6}$, $y = \frac{1}{2}$ ← won't see on table



3. $-2x + y = -2$

x int: $-2x + 0 = -2$, $\frac{-2x}{-2} = \frac{-2}{-2}$, $x = 1$

y int: $-2(0) + y = -2$, $y = -2$

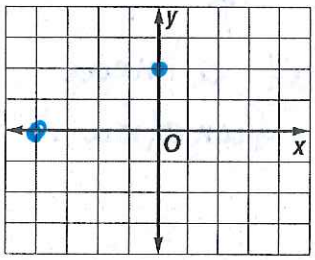


x	y
0	-2
1	0

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

x int: $0 = \frac{1}{2}x + 2$, $2(-2) = \left(\frac{1}{2}x\right)2$, $-4 = x$

y int: $y = \frac{1}{2}(0) + 2$, $y = 2$



x	y
-4	0
0	2

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3-1 Graphing Linear Equations

variables = no exponents * no variables being multiplied together

Identify Linear Equations and Intercepts A **linear equation** is an equation that can be written in the form $Ax + By = C$. This is called the **standard form** of a linear equation.

Standard Form of a Linear Equation	$Ax + By = C$, where $A \geq 0$, A and B are not both zero, and A, B, and C are integers with a greatest common factor of 1

Example 1: Determine whether $y = 6 - 3x$ is a linear equation. Write the equation in standard form.

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

$A = 3$
$B = 1$
$C = 6$

Example 2: $3xy + y = 4 + 2x$

↑ not a linear equation!

Exercises

Determine whether each equation is a linear equation. Write *yes* or *no*. If yes, write the equation in standard form and identify A, B & C.

$Ax + By = C$

1. $2x = 4y$

$-4y \quad -4y$

$2x - 4y = 0$

$x - 2y = 0$

$A = 1 \quad B = -2 \quad C = 0$

2. $6 + y = 8$

$-6 \quad -6$

$y = 2$

could be written as:

$0x + y = 2$

$A = 0 \quad B = 1 \quad C =$

4. $3xy + 8 = 4y$

↑ not a linear function!

5. $3x - 4 = 12$

$+4 \quad +4$

$3x = 16$

could be written as:

$3x + 0y = 16$

$A = 3 \quad B = 0 \quad C = 16$

6. $y = x^2 + 7$

↑ not a linear function!

7. $y - 4x = 9$

$-4x + y = 9 \Rightarrow 4x - y = -9$

↑ can't have negative # on x.

$A = 4$
$B = -1$
$C = -9$

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

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

$2x + 4y = 3$

$A = 2$
$B = 4$
$C = 3$

9. $\frac{1}{4}y = 12 - 4x$

$+4x \quad +4x$

$4\left[4x + \frac{1}{4}y = 12\right] \Rightarrow 16x + y = 48$

↑ no fractions!

$A = 16$
$B = 1$
$C = 48$