Standard form

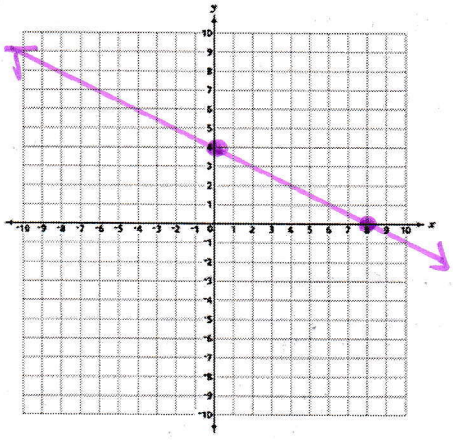
Remember $Ax + By = C$ is called the standard form of a linear equation. To graph in standard form, you need to find the x and y intercepts. To find the ***x*-intercept, let** $y = 0$ and solve for x. To find the ***y*-intercept, let** $x = 0$ and solve for y. The ***x*-intercept** is sometimes referred to as the zero.

Graph each of the following standard form equations.

$x + 2y = 8$

x int ($y = 0$)
$x + 2(0) = 8$
$x + 0 = 8$
$x = 8$

y int ($x = 0$)
$0 + 2y = 8$
$\frac{2y}{2} = \frac{8}{2}$
$y = 4$

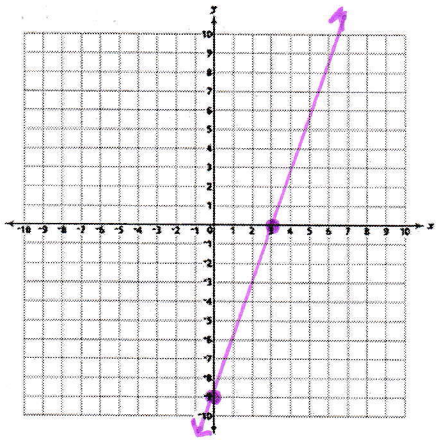


***x*-int:** (8,0) ***y*-int:** (0,4)

$3x - y = 9$

x int ($y = 0$)
$3x - 0 = 9$
$3x = 9$
$x = 3$

y int ($x = 0$)
$3(0) - y = 9$
$-y = 9$
$-1 \quad -1$
$y = -9$



***x*-int:** (3,0) ***y*-int:** (0,-9)

Standard Form:

- Needs to be in the form $Ax + By = C$.
- A, B, and C must be integers (no fractions/decimals)
- A must be positive.

LCM of the denominators

4: (8) 12, 16, ...
8: 16, 24, 32, ...

Convert each of the following standard form.

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

$y = 3x + 1$
$-3x \quad -3x$
$-1(-3x + y = 1)$
$3x - y = -1$

$y = \frac{1}{2}x + 5$
$-\frac{1}{2}x \quad -\frac{1}{2}x$
$-2\left(-\frac{1}{2}x + y = 5\right)$
$x - 2y = -10$

$y = -\frac{1}{4}x + \frac{1}{8}$
$+\frac{1}{4}x \quad +\frac{1}{4}x$
$8\left(\frac{1}{4}x + y = \frac{1}{8}\right)$
$2x + 8y = 1$

You earn $16 an hour mowing lawns and $10 an hour washing windows. You want to make $500 in one week. This situation can be represented by the equation $16x + 10y = 500$ where x is the number of hours you mow lawns and y is the number of hours you wash windows.

Find the intercepts of the graph of the equation.

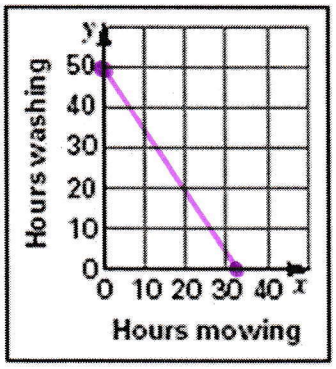
x-int: (31.25, 0) y-int: (0, 50)

xint ($y=0$)

$16x + 10(0) = 500$

$\frac{16x}{16} = \frac{500}{16}$

$x = 31.25$



Graph the equation.

What do the intercepts mean in this situation about mowing & washing?

The x-int means 31.25 mowing & 0 washing windows

The y-int means 0 hrs. mowing & 50 hrs. washing.

yint ($x=0$)

$16(0) + 10y = 500$

$\frac{10y}{10} = \frac{500}{10}$

$y = 50$

If you work 30 hours washing windows, how many hours do you have to mow lawns?

$y = 30$

$16x + 10(30) = 500$

$16x + 300 = 500$

$-300 \quad -300$

$\frac{16x}{16} = \frac{200}{16}$

$x = 12.5$ hrs. mowing

Practice Staar Question

Which graph represents $-3x + 5y = -15$?

xint ($y=0$)

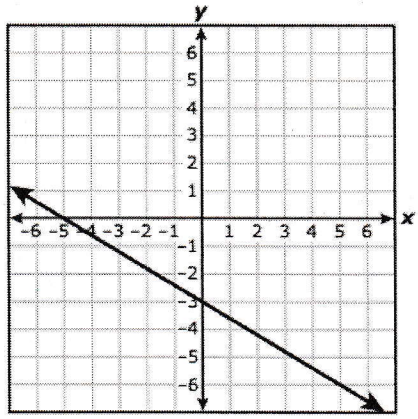
$-3x + 5(0) = -15$

$\frac{-3x}{-3} = \frac{-15}{-3}$

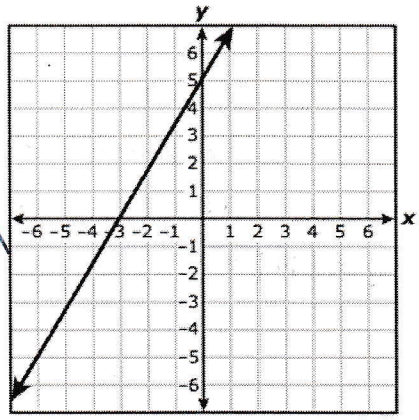
$x = 5$

$(5, 0)$

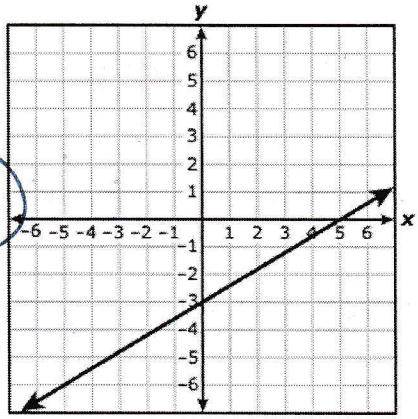
A



C



B



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