

Algebra 5.5 Standard Form Notes

Standard Form:

- is used to determine whether or not an equation is linear.
- allows you to find the intercepts quickly.
- If you cannot write an equation in Standard form, it is Not linear.

$$Ax + By = C$$

x & y coordinates

coefficients of x & y constant

The following can be TRUE for Standard Form:

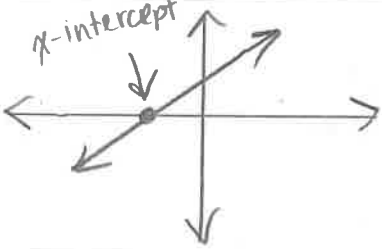
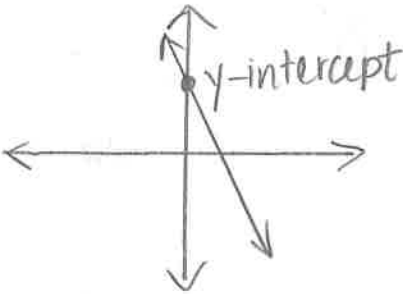
- A ≥ 0
- A, B, & C are integers whose greatest common factor is 1.

The following are NOT TRUE for Standard Form. Therefore, if any of the below exists, the equation will NEVER be linear.

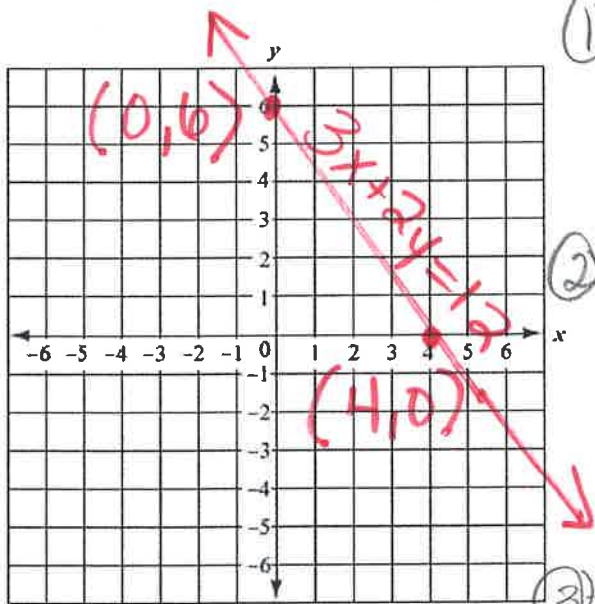
- A & B cannot BOTH be zero.
- variables cannot be in the denominator.
- Exponents cannot be to another ~~power~~ power other than the 1st power.
- x & y cannot be multiplied together.

Rewrite these equations in standard form. Then determine if it is a linear equation.

1.) $3x + 1y = 12$ Already simplified, <u>Yes</u>	2.) $y + 12 = 0$ $-12 -12$ $y = -12$ <u>Yes</u>
3.) $3x = 10y$ $-10y -10y$ $3x - 10y = 0$, <u>Yes</u>	4.) $y - 3x = 6 + 2$ $y - 3x = 8$ $-3x + y = 8$ <u>Yes</u>
5.) $\frac{12x + 3y = 9}{3}$ $4x + y = 3$, <u>Yes</u>	6.) $3\left(\frac{1}{3}y = -1\right)$ $1y = -3$, <u>Yes</u>
7.) $4xy + 4y = 10$ No, x & y are multiplied	8.) $2x^2 + 7y = 14$ No, x is to the 2nd power
9.) $4 = \frac{8}{2}$ $4 = 4$ No, $A \neq B$ are <u>BOTH</u> zero	10.) $\frac{2}{x} + \frac{3}{y} = 17$ No, x & y are in the denominator

	What is it?	Sketch of a graph	What do the ordered pairs look like?
x-intercept	The x -intercept is where the line crosses the <u>x-axis</u> .		$(x, 0)$ y-coordinate will always be zero x-coordinate will be a #
y-intercept	The y -intercept is where the line crosses the <u>y-axis</u> .		$(0, y)$ y-coordinate will be a # x-coordinate will always be zero

Example: Graph $3x+2y=12$ using intercepts.



① Check to make sure the equation is written in Standard form

$$3x+2y=12$$

② To find the x-intercept, let $y=0$

$$\begin{aligned} 3x+2(0) &= 12 \\ 3x+0 &= 12 \\ \underline{3x} &= 12 \\ 3 & \end{aligned}$$

$x=4$
y-intercept = $(4, 0)$

③ To find the y-intercept, let $x=0$

$$\begin{aligned} 3(0)+2y &= 12 \\ 0+2y &= 12 \\ \underline{2y} &= 12 \\ 2 & \end{aligned}$$

$y=6$
x-intercept = $(0, 6)$

④ Now graph

Got it #4

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

$$y-2 = -\frac{1}{3}x + -2$$

$$y = -\frac{1}{3}x$$

$$+\frac{1}{3}x \quad +\frac{1}{3}x$$

$$3\left(\frac{1}{3}x + y = 0\right)$$

$$x + 3y = 0$$

*Make sure all the Rules apply!

Now you know 3 ways to write linear equations:

- Slope-intercept form: $y = mx+b$
- Point-slope form: $y-y_1 = m(x-x_1)$
- Standard Form: $Ax + By = C$

Got it #5

A) $Ax+By=C$
 $x+15y=60$

B) Domains would be non-negative integers less than or equal to 60.

Ranges would be $\{0, 1, 2, 3, 4\}$.

*It's all about changing the appearance of a linear equation, BUT NOT the value! ;)

