

Notes Finding the Intercepts from Standard Form

x - intercept the point where a function hits the x-axis $(x, 0)$

y - intercept the point where a function hits the y-axis $(0, y)$

Standard Form

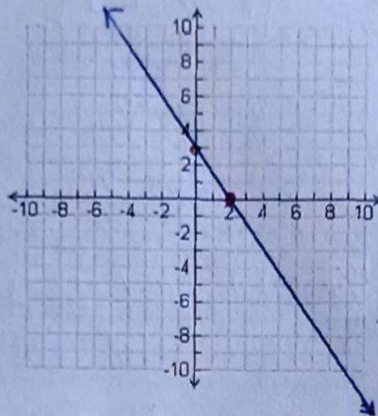
$$Ax + By = C$$

- > x and y are on the same side of the equal sign
- > A, B and C are integers (no fractions)
- > A is positive

To Find the intercepts from Standard Form:

$$3x + 2y = 6$$

$(x, 0)$ $3x + 2(0) = 6$ $3x = 6$ $x = 2$ $(2, 0)$	$(0, y)$ $3(0) + 2y = 6$ $2y = 6$ $y = 3$ $(0, 3)$
--	--



Cover Up Method

$$6x - 8y = 24$$

$(x, 0)$ $6x - 8(0) = 24$ $6x = 24$ $x = 4$ $(4, 0)$	$(0, y)$ $6(0) - 8y = 24$ $-8y = 24$ $y = -3$ $(0, -3)$
--	---

$$5x - 2y = -10$$

$(x, 0)$ $5x - 2(0) = -10$ $5x = -10$ $x = -2$ $(-2, 0)$	$(0, y)$ $5(0) - 2y = -10$ $-2y = -10$ $y = 5$ $(0, 5)$
--	---

$$4x - 3y = 12$$

$(x, 0)$ $4x - 3(0) = 12$ $4x = 12$ $x = 3$ $(3, 0)$	$(0, y)$ $4(0) - 3y = 12$ $-3y = 12$ $y = -4$ $(0, -4)$
--	---

Applications

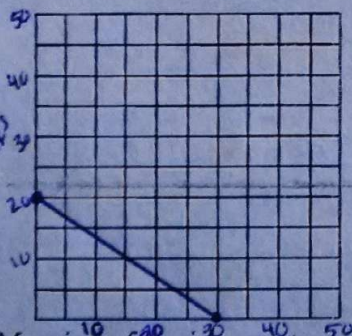
The school store sells pens for \$2.00 each and notebooks for \$3.00 each. The equation $2x + 3y = 60$ represents the number of pens, x , and notebooks, y , you can purchase for \$60.

Find the intercepts and graph the function

$$2x + 3y = 60$$

$(30, 0)$	$(0, 20)$
-----------	-----------

Slope: $\frac{2}{3}$ $\frac{20-0}{0-30}$



Meaning of x - intercept:

$(30, 0)$: if I buy 30 pens, I cannot buy any notebooks w/ \$60

Meaning of y - intercept:

$(0, 20)$ maximum # of notebooks you can buy w/ \$60

A 100 - point test has x questions worth 2 points each and y questions worth 4 points each.

Write an equation to represent this situation.

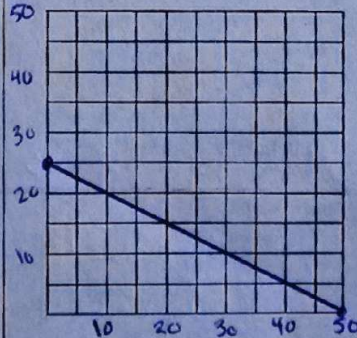
$$2x + 4y = 100$$

Find the intercept and graph the function.

$$2x + 4y = 100$$

$(50, 0)$	$(0, 25)$
-----------	-----------

Slope: $-\frac{1}{2}$



Meaning of x - intercept:

$(50, 0)$

Meaning of y - intercept:

$(0, 25)$

Notes Rearranging 2 - Variable Equations

slope-intercept form

→ FRACTIONS! OK!

Clear all fractions then rearrange and solve for y. Write in the form $y = m x + b$.

$1) \quad \begin{array}{r} 4x + 5y = 20 \\ -4x \quad -4y \\ \hline 5y = -4x + 20 \\ \frac{5y}{5} = \frac{-4x + 20}{5} \\ \hline y = -\frac{4}{5}x + 4 \end{array}$	$2) \quad \begin{array}{r} 6x = 3y - 21 \\ +21 \quad +21 \\ \hline 6x + 21 = 3y \\ \frac{6x + 21}{3} = \frac{3y}{3} \\ \hline y = 2x + 7 \end{array}$	$3) \quad \begin{array}{r} 8x - 9y = 72 \\ -8x \quad -8x \\ \hline -9y = -8x + 72 \\ \frac{-9y}{-9} = \frac{-8x + 72}{-9} \\ \hline y = \frac{8}{9}x - 8 \end{array}$
$4) \quad \begin{array}{r} \frac{2}{3}x + \frac{3}{5}y = 5 \\ 10x + 9y = 75 \\ -10x \quad -10x \\ \hline 9y = -10x + 75 \\ \hline y = -\frac{10}{9}x + \frac{25}{3} \end{array}$	$5) \quad \begin{array}{r} 3(x-4) = 2(y+6) \\ 3x - 12 = 2y + 12 \\ -12 \quad -12 \\ \hline 3x - 24 = 2y \\ \frac{3x - 24}{2} = \frac{2y}{2} \\ \hline y = \frac{3}{2}x - 12 \end{array}$	$6) \quad \begin{array}{r} \frac{x-3}{4} = \frac{3-y}{3} \\ 3(x-3) = 4(3-y) \\ 3x - 9 = 12 - 4y \\ 3x - 21 = -4y \\ \hline y = -\frac{3}{4}x + \frac{21}{4} \end{array}$

Clear all fractions then rearrange and write in Standard Form ($Ax + By = C$) Remember to keep A positive and there should be NO fractions in your answer. **No FRACTIONS!**

$7) \quad \begin{array}{r} 7y = 10 - 4x \\ +4x \quad +4x \\ \hline 4x + 7y = 10 \end{array}$	$8) \quad \begin{array}{r} 9 + \frac{2}{7}x = 3y - 7 \\ 63 + 2x = 21y - 49 \\ -2x \quad -2x \\ \hline -1(63 = -2x + 21y) \\ \hline 2x - 21y = -43 \end{array}$	$9) \quad \begin{array}{r} 2(x-5) = 3(y+4) \\ 2x - 10 = 3y + 12 \\ \hline 2x - 3y = 22 \end{array}$
--	--	---

Clear all fractions then rearrange the equation into Standard Form ($Ax + By = C$). Remember to keep A positive and there should not be any fractions.

$13) \quad \begin{array}{r} y + 3 = -5(x-4) \\ y + 3 = -5x + 20 \\ \hline 5x + y = 17 \end{array}$	$14) \quad \begin{array}{r} y - 7 = \frac{1}{2}(x+9) \\ 2y - 14 = x + 9 \\ (-x + 2y = 23) \times (-1) \\ \hline x - 2y = -23 \end{array}$	$15) \quad \begin{array}{r} y + 8 = \frac{3}{7}(x-5) \\ 7y + 56 = 3x - 15 \\ (-3x + 7y = -71) \times (-1) \\ \hline 3x - 7y = 71 \end{array}$
--	---	---

Clear all fractions then solve for y. Write your answers in the form $y = m x + b$. You may have some fractions and that is ok!

$16) \quad \begin{array}{r} y + 6 = -4(x-3) \\ y + 6 = -4x + 12 \\ \hline y = -4x + 6 \end{array}$	$17) \quad \begin{array}{r} y + 10 = \frac{4}{3}(x-5) \\ 3y + 30 = 4(x-5) \\ 3y + 30 = 4x - 20 \\ \hline 3y = 4x - 50 \\ \hline y = \frac{4}{3}x - \frac{50}{3} \end{array}$	$18) \quad \begin{array}{r} y - 7 = -\frac{6}{5}(x-4) \\ 5y - 35 = -6(x-4) \\ 5y - 35 = -6x + 24 \\ 5y = -6x + 59 \\ \hline y = -\frac{6}{5}x + \frac{59}{5} \end{array}$
--	--	---