General Form - Equation of a Line

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$$Ax + By + C = 0$$

- All terms on Left
- Equals zero on the right
- x's then y's then constant
- A must be a positive integer
- B and C must be integers

- To determine the slope and y-intercept we need to rearrange from general form into slope-intercept form.

Ex. Find the slope (m) and y-int (b): $2x - 5y + 25 = 0$

- Rearrange into $y = mx + b$

$$2x - 5y + 25 = 0$$
$$-2x \qquad -2x$$
$$-5y + 25 = -2x$$
$$-25 \qquad -25$$
$$-5y = -2x - 25$$

* Divide all 3 terms by -5

$$\frac{-5y}{-5} = \frac{-2x}{-5} - \frac{25}{-5}$$

$$y = \frac{2}{5}x + 5$$

slope $= \frac{2}{5}$

y-intercept $= 5$

Ex. Rewrite in slope-intercept form:

$y = mx + b$

$$2x - 3y - 6 = 0$$
$$-2x \qquad -2x$$
$$-3y - 6 = -2x$$
$$+6 \qquad +6$$
$$-3y = -2x + 6$$
$$\frac{-3y}{-3} = \frac{-2x}{-3} + \frac{6}{-3}$$

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

$$\boxed{y = \frac{2}{3}x - 2}$$

Ex. Solve for the x-intercept, and the y-intercept. Then graph the line. $4x + 5y - 20 = 0$

x-int $(y = 0)$

$4x + 5(0) - 20 = 0$

$4x + 0 - 20 = 0$

$4x - 20 = 0$

$+20 \quad +20$

$\frac{4x}{4} = \frac{20}{4}$

$\boxed{x = 5}$

y-int $(x = 0)$

$4(0) + 5y - 20 = 0$

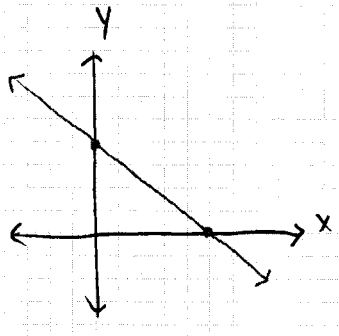
$0 + 5y - 20 = 0$

$5y - 20 = 0$

$+20 \quad +20$

$\frac{5y}{5} = \frac{20}{5}$

$\boxed{y = 4}$



Ex. Write each equation in general form: $Ax + By + C = 0$

a) $y = 5x - 8$

$-5x \quad -5x$

$-5x + y = -8$

$+8 \quad +8$

$-5x + y + 8 = 0$

↑ can't be negative!

$(-5x + y + 8 = 0) \cdot (-1)$

$5x - y - 8 = 0$

↑ Multiply by -1 to change all the signs.

b) $y = \frac{2}{3}x - 7$

$-\frac{2}{3}x \quad -\frac{2}{3}x$

$-\frac{2}{3}x + y = -7$

$+7 \quad +7$

$\left(-\frac{2}{3}x + y + 7 = 0\right) \cdot (-1)$

$\left(\frac{2}{3}x - y - 7 = 0\right) \times 3$ mult by denominator

$2x - 3y - 21 = 0$

* Board work