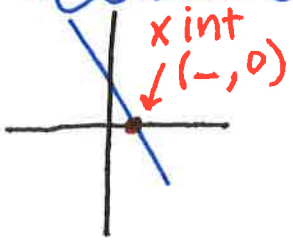
*definition → Foldable

2.3 Standard Form Guided Notes

x-intercepts point where line crosses the x-axis.

*when $y=0$

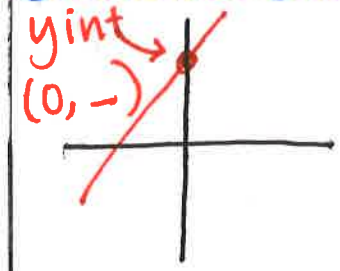


Algebraically

*plug in zero for y & solve for x!

y-intercepts: point where the line crosses the y-axis.

*when $x=0$



Algebraically

*plug in zero for x & solve for y!

Ex 1: Hanna will spend \$150 on tickets total. Each VIP ticket costs \$25 and each General Admission costs \$10. How can you represent this situation with a linear equation?

← Restriction

← Restriction

Standard Form: $Ax + By = C$

x = VIP tickets

y = GA tickets

$\therefore \boxed{25x + 10y = 150}$

25 = Amount per VIP; 10 = Amount per GA; 150 = total \$

Graphing Equations in Standard Form

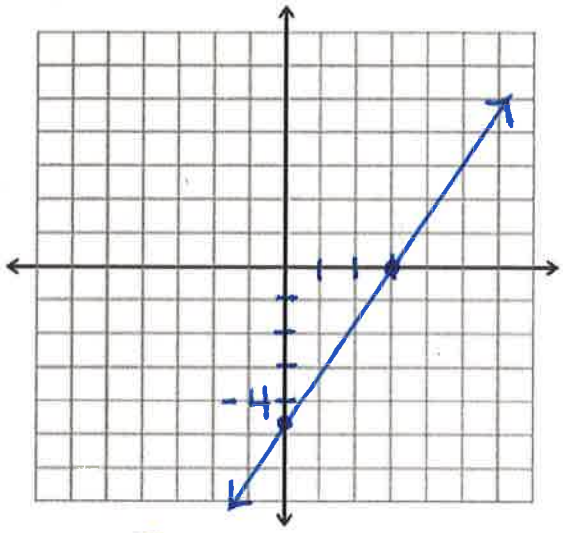
Step 1 Find x-intercept
→ plug in zero for y & solve for x!

Step 2 Find y-intercept
→ plug in zero for x & solve for y!

Step 3 plot points & connect line ☺

Standard Form

Ex 2: Graph $3x - 2y = 9$



x int: $3x - 2(0) = 9$

*0 for y!

$\frac{3x}{3} = \frac{9}{3}$

$x = 3 \therefore (3,0)$

y int: $3(0) - 2y = 9$

*0 for x!

$-2y = 9$

$y = -4.5 \therefore (0, -4.5)$

Converting from Standard Form to Slope intercept Form

$Ax + By = C \longrightarrow y = mx + b$

Ex 3:

Convert $2x + 5y = 17$ to slope intercept form

$-2x \quad -2x$

*get y to one side!

$\frac{5y}{5} = \frac{17 - 2x}{5}$

$y = \frac{17}{5} - \frac{2}{5}x$

$y = -\frac{2}{5}x + \frac{17}{5}$ ☺

$y = mx + b$

Writing Equations

Ex 4: Write an equation in standard form that has an x intercept of 5 and a y intercept of 3.

(5,0)

↳ (0,3) ← b

*write in slope intercept form & then convert.

two points: $(0,3)$ & $(5,0)$ — x_1, y_1 & x_2, y_2

$$m = \frac{3-0}{0-5} = \frac{3}{-5} = -\frac{3}{5}$$

$$y = -\frac{3}{5}x + 3$$ *Now convert! $Ax + By = C$ ← # is alone!

$+\frac{3}{5}x \quad +\frac{3}{5}x$

$$\cancel{Ax + By = C}$$

$$\boxed{\frac{3}{5}x + 1y = 3}$$

Ex 5: Write an equation in standard form that has an x intercept of 6 and a y intercept of -1.

$(6,0)$ — x_2, y_2

↳ $(0,-1)$ — x_1, y_1

$$m = \frac{-1-0}{0-6} = \frac{-1}{-6} = \frac{1}{6}$$

$$y = \frac{1}{6}x - 1$$ *convert!

$-\frac{1}{6}x \quad -\frac{1}{6}x$

$$\boxed{-\frac{1}{6}x + y = -1}$$