T-G Geometry Week 14 12/12

Find the sum of the interior angles of a

a) dodecagon (12-gon)

$180(n-2)$ $n = \#$ of sides

$n = 12$

$180(12-2)$

$180(10) = \boxed{1800^\circ}$

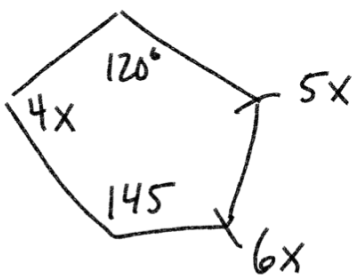
b.) hexacontagon (60-gon)

$180(60-2)$

$180(58)$

$\boxed{10{,}440^\circ}$

Find the value of x.




(not drawn to scale)

$180(5-2)$

$180(3) = 540$

$4x + 145 + 6x + 5x + 120 = 540$

$15x + 265 = 540$

$-265 \quad -265$

$\frac{15x}{15} = \frac{275}{15}$

$\boxed{x = 18.3}$

Find the individual interior angle of a regular 18-gon.

↳ all angles equal

$\frac{180(n-2)}{n}$

$\frac{\cancel{180}^{10}(18-2)}{\cancel{18}} = 10(16) = \boxed{160^\circ}$

Find slope.

$x_1\ y_1 \qquad x_2\ y_2$

$(2,5) \quad (-1,-4)$

$x_2\ y_2 \qquad x_1\ y_1$

$$\text{slope} = m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-4-5}{-1-2} = \frac{-9}{-3} = \boxed{3}$$

$$\frac{5-(-4)}{2-(-1)} = \frac{5+4}{2+1} = \frac{9}{3} = \boxed{3}$$

Write in linear equation

slope $= \frac{2}{3}$ y-intercept $= -5$

$$\boxed{y = \frac{2}{3}x - 5}$$

slope-intercept form

$y = mx + b$

slope y-int

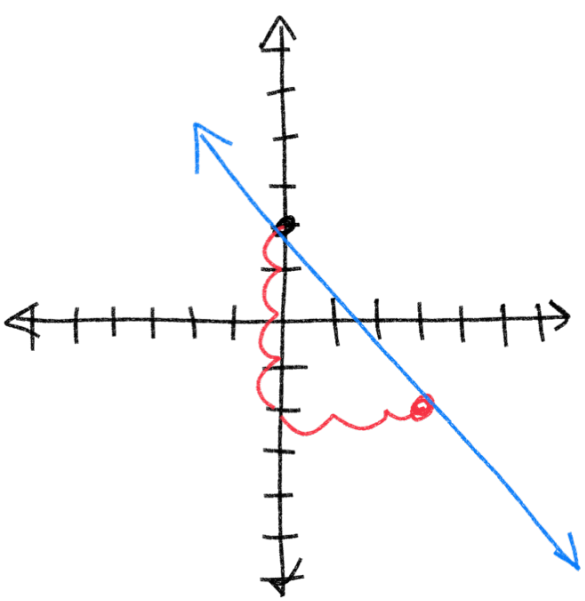
Graph $y = -\frac{4}{3}x + 2$

y-int

1.) Graph y-int

2.) Use slope

$$\frac{-4}{3} = \frac{\text{down } 4}{\text{right } 3}$$



Find the equation for a line:

$\boxed{\text{slope} = \frac{2}{3}}$ through $(-3, 9)$

$x \quad y$

$y = mx + b$

$9 = \left(\frac{2}{\cancel{3}}\right)(-\cancel{3}) + b$

$9 = -2 + b$

$+2 \quad +2$

$\boxed{11 = b}$

$y = mx + b$

$\boxed{y = \frac{2}{3}x + 11}$

Find the equation for the line between $(5, -3)$ and $(0, -2)$

1.) Find slope

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2-(-3)}{0-5} = \frac{-2+3}{0-5} = \boxed{-\frac{1}{5}}$$

2.) Plug into $y = mx + b$ to find y-int

$y = mx + b$

$-2 = \cancel{\left(-\frac{1}{5}\right)(0)}^{\,0} + b$

$\boxed{-2 = b}$

$y = mx + b$

$\boxed{y = -\frac{1}{5}x - 2}$

Find linear equation with the points

$$\underset{pt\,1}{(1, 8)} \text{ and } \underset{pt\,2}{(\overset{x}{3}, \overset{y}{-2})}$$

1.) Find slope

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8-(-2)}{1-3} = \frac{8+2}{1-3} = \frac{10}{-2} = -5$$

2.) $y = mx + b$

$$y = mx + b$$

$$-2 = (-5)(3) + b$$

$$-2 = -15 + b$$

$$+15 \quad -(-15)$$

$$+15$$

$$13 = b$$

$$\boxed{y = -5x + 13}$$

## Standard Form

$$Ax + By = C$$

$$5x + 4y = 20$$

y-int

$$\cancel{5x} + \frac{4y}{4} = \frac{20}{4} \quad (0, 5)$$

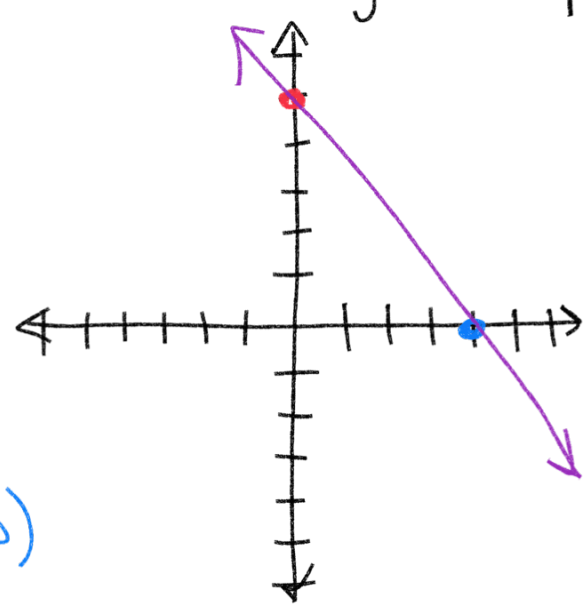
$x = 0$ $\quad y = 5$

x-int

$$\frac{5x}{5} + \cancel{4y} = \frac{20}{5} \quad (4, 0)$$

$y = 0$ $\quad x = 4$

Graph using x and y intercepts



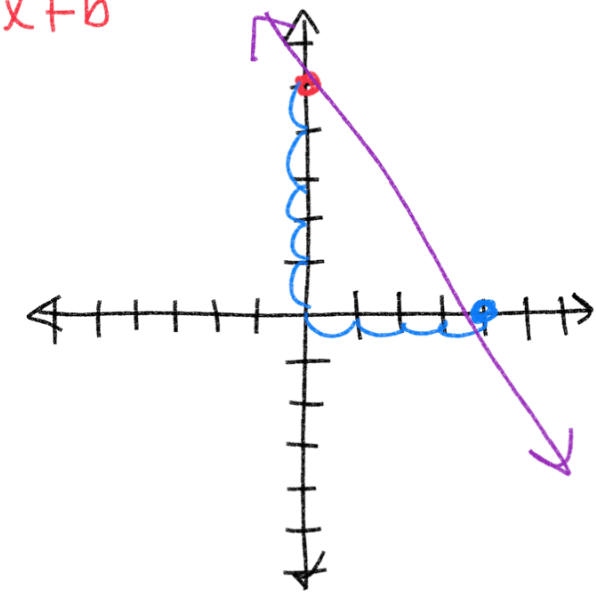
$y = mx + b$

$$5x + 4y = 20$$

$-5x \qquad -5x$

$$\frac{4y}{4} = \frac{-5x}{4} + \frac{20}{4}$$

$$y = -\frac{5}{4}x + 5$$



$$2x + 6y = 12$$

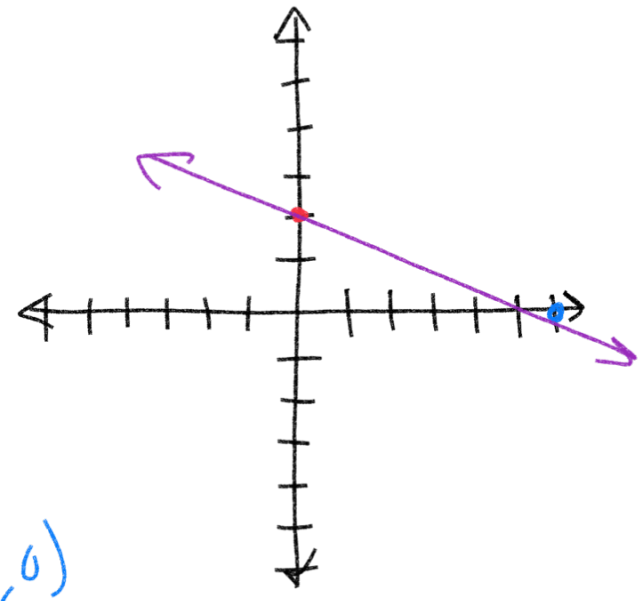
$$\cancel{2x} + \frac{6y}{6} = \frac{12}{6}$$

$x = 0$

$y = 2 \quad (0,2)$

$$\frac{2x}{2} + \cancel{6y} = \frac{12}{2}$$

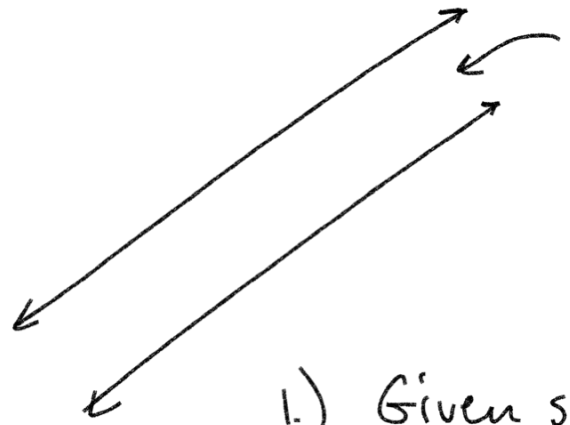
$y = 0 \quad x = 6 \quad (6,0)$



# Parallel Lines

Never touch

slopes are <u>equal</u>



Find equation for a line <u>parallel</u> to $y = 3x+2$ through the point $(4, 8)$

x y

1.) Given slope: $\boxed{3}$

2.) Needed slope: $3 = m$

3.) $y = mx + b$

$8 = (3)(4) + b$

$8 = 12 + b$

$-12 \quad -12$

$-4 = b$

$y = mx + b$

$\boxed{y = 3x - 4}$

$y = 3x + 2$

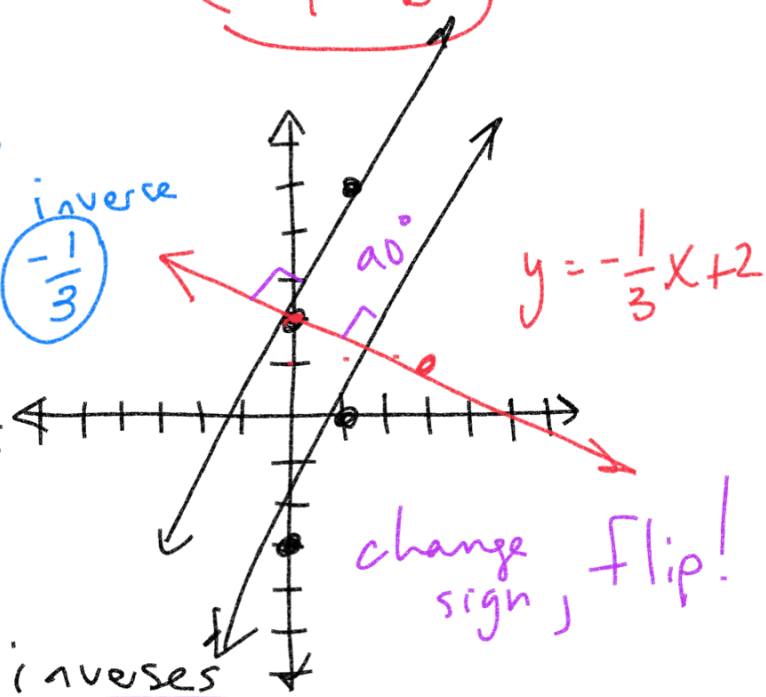
$y = 3x - 3$

slope = 3

opposite

inverse

$3 \rightarrow -3 \rightarrow -\frac{1}{3}$




Perpendicular lines intersect at 90°

Have slopes that are <u>opposite</u> <u>inverses</u>

change sign, flip!