Warm Up

Determine the equation of each of the following lines...
(Express equations in GENERAL FORM)

1. perpendicular to the line y = -4x +2 and having y-intercept 3.

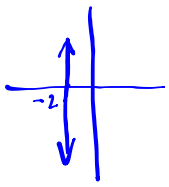
$y = -4x + 2$, $m = -4$, $\perp m = \frac{1}{4}$

y-int = 3, $y = mx + b$, $y = \frac{1}{4}x + 3$

$4y = x + 12$, $-x + 4y - 12 = 0$, $x - 4y + 12 = 0$

2. passing through the points (-2, -7) and (-2, 4).

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - (-7)}{-2 - (-2)} = \frac{11}{0}$ undefined



$x = -2$

6.6 General Form of the Equation for a Linear Relation

General Form of the Equation of a Linear Relation

$Ax + By + C = 0$ is the general form of the equation of a line, where A is a whole number, and B and C are integers.

Features...it is a 'look' NOT a formula!!!

- coefficient in front of x term always positive
- no fractions
- equation set equal to zero

Example 1 Rewriting an Equation in General Form

Write each equation in general form.

a) $y = \frac{2}{3}x + 4$

$3y = 2x + 12$

$2x - 3y + 12 = 0$

b) $y - 1 = \frac{3}{5}(x + 2)$

$5y - 5 = 3x + 6$

$3x - 5y + 5 + 6 = 0$

$3x - 5y + 11 = 0$

STEPS...General Form

1) Get rid of fractions
(Multiply each term by denominator)
2) Get rid of brackets (distribute)
3) Rearrange so x term is positive and equation is equal to zero

6.6 General Form of the Equation for a Linear Relation

YOUR TURN...

CHECK YOUR UNDERSTANDING

1. Write each equation in general form.

a) $y = -\frac{1}{4}x + 3$

b) $y + 2 = \frac{3}{2}(x - 4)$

a) $y = -\frac{1}{4}x + 3$

$4y = -1x + 12$

$x + 4y - 12 = 0$

b) $y + 2 = \frac{3}{2}(x - 4)$

$2(y + 2) = 3(x - 4)$

$2y + 4 = 3x - 12$

$3x - 2y - 4 - 12 = 0$

$3x - 2y - 16 = 0$

Example 2 Graphing a Line in General Form

a) Determine the x- and y-intercepts of the line whose equation is: $3x + 2y - 18 = 0$

b) Graph the line.

$3x+2y-18=0$

x-int $y=0$

$3x+2(0)-18=0$

$3x-18=0$

$3x=18$

$x=6$

$(6,0)$

y-int let $x=0$

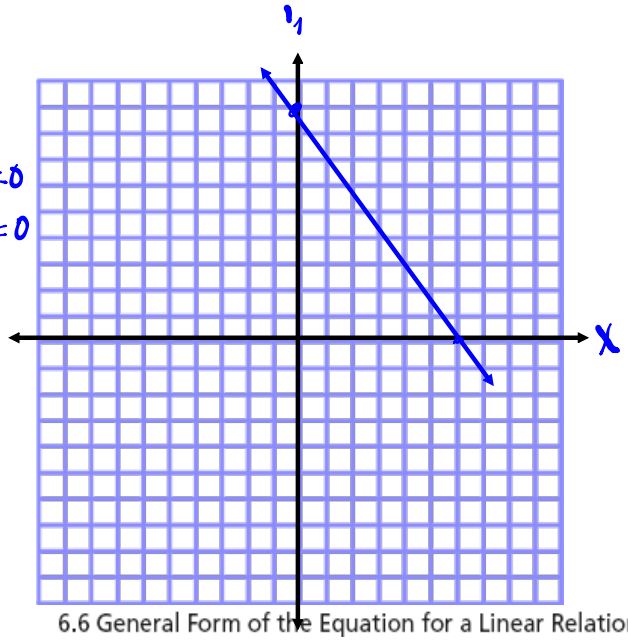
$3(0)+2y-18=0$

$2y-18=0$

$2y=18$

$y=9$

$(0,9)$



6.6 General Form of the Equation for a Linear Relation

YOUR TURN...

CHECK YOUR UNDERSTANDING

2. a) Determine the x- and y-intercepts of the line whose equation is: $x + 3y + 9 = 0$

b) Graph the line.

c) Verify that the graph is correct.

$x+3y+9=0$

x int let $y=0$

$x+3(0)+9=0$

$x+9=0$

$x=-9$

$(-9,0)$

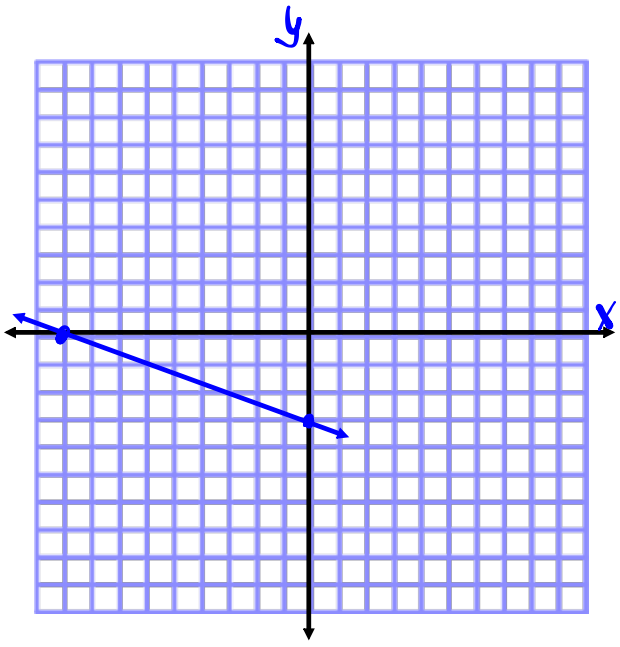
y int let $x=0$

$0+3y+9=0$

$3y=-9$

$y=-3$

$(0,-3)$



Example 3 Determining the Slope of a Line Given Its Equation in General Form

Determine the slope of the line with this equation:

$3x - 2y - 16 = 0$

$\frac{-2y}{-2} = \frac{-3x}{-2} + \frac{16}{-2}$

$y = \frac{3}{2}x - 8$

$m = \frac{3}{2}$

6.6 General Form of the Equation for a Linear Relation

YOUR TURN...

CHECK YOUR UNDERSTANDING

3. Determine the slope of the line with this equation:
$5x - 2y + 12 = 0$

$\frac{-2y}{-2} = \frac{-5x}{-2} - \frac{12}{-2}$

$y = \frac{5}{2}x + 6$

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

4 forms of the linear equation...

1) Slope-Intercept Form

$$y = mx + b$$

2) Slope-Point Form

$$y - y_1 = m(x - x_1)$$

3) General Form

$$Ax + By + C = 0$$

4) Standard Form

$$Ax + By = C$$

Practice Problems...

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