Warm Up

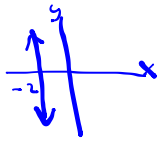
Determine the equation of each of the following lines...
(Express equations in GENERAL FORM) $Ax+By+C=0$

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

$m=-4$ $y=mx+b$
$-\frac{1}{m}=\frac{1}{4}$ $y=\frac{1}{4}x+3$
$4y=x+12$ → $-x+4y-12=0$
$x-4y+12=0$

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



$x=-2$
$x+2=0$

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) $y = -\frac{2}{3}x + 4$ b) $y - 1 = \frac{3}{5}(x + 2)$

$3y = -2x + 12$

$2x + 3y - 12 = 0$

b) $5(y-1) = 3(x+2)$

$5y - 5 = 3x + 6$

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

$3x - 5y + 11 = 0$

STEPS...General Form $Ax+By+C=0$

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

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

$4y = -1x + 12$

$x + 4y - 12 = 0$

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

$2y + 4 = 3x - 12$

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

$-3x + 2y + 16 = 0$

$3x - 2y - 16 = 0$

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.

x int let y=0

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

$\frac{3x}{3} = \frac{18}{3}$

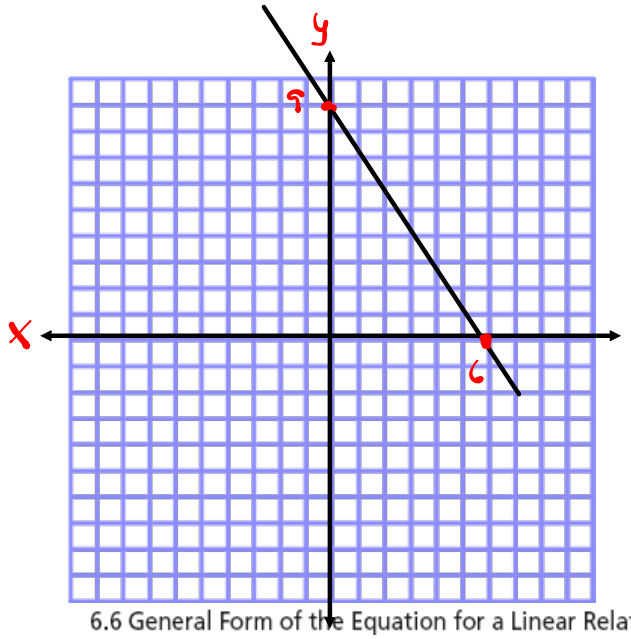
$x = 6$ (6,0)

y int let x=0

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

$\frac{2y}{2} = \frac{18}{2}$

$y = 9$ (0,9)



6.6 General Form of the Equation for a Linear Relation

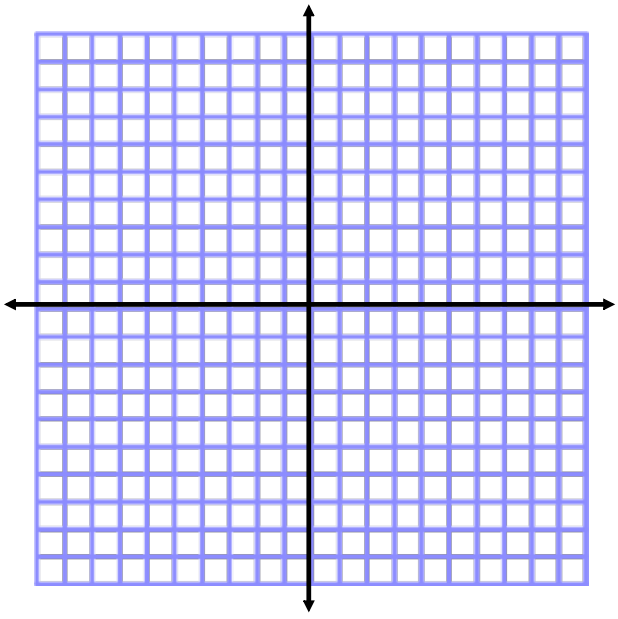
YOUR TURN...

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.



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

Determine the slope of the line with this equation:

$3x - 2y - 16 = 0$

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

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

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

$b = -8$ (y-int)

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:
$5x - 2y + 12 = 0$

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

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

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

$y = mx + b$

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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