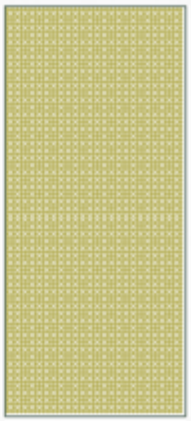
6.6

GENERAL FORM OF THE EQUATION FOR A LINEAR RELATION



GENERAL FORM

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.

- A, B, C cannot be fractions
- A must be positive

EX 1 REWRITING AN EQUATION IN GENERAL FORM

a) $y = -\frac{2}{3}x + 4$ ← make this ∅

$\cdot 12$

$3y = -2x + 12$ $\quad -12$

$+2x \quad +2x$

$3y - 12 = -2x$

$2x + 3y - 12 = 0$ ✓

EX 1 CONTINUED

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

5

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

$-6 \quad -6$

$5y - 5 = 3x + 6$

$5y - 11 = 3x - 3x$

$-1(-3x + 5y - 11 = 0)$ ← to get rid of −A, multiply everything by a −1.

$3x - 5y + 11 = 0$ ✓

YOUR TURN

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

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

EX 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

Set $y = 0$

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

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

$x = 6$

$(6, 0)$

y-int

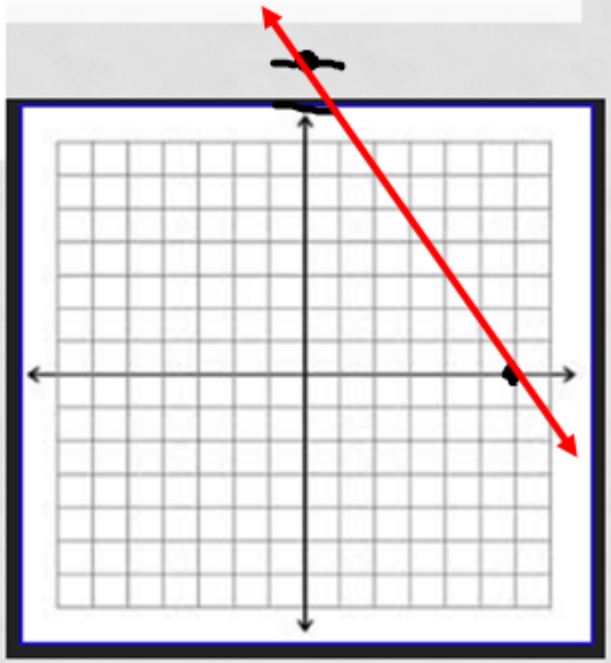
Set x to $\emptyset$

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

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

$y = 9$

$(0, 9)$



x-int

$(x, 0)$

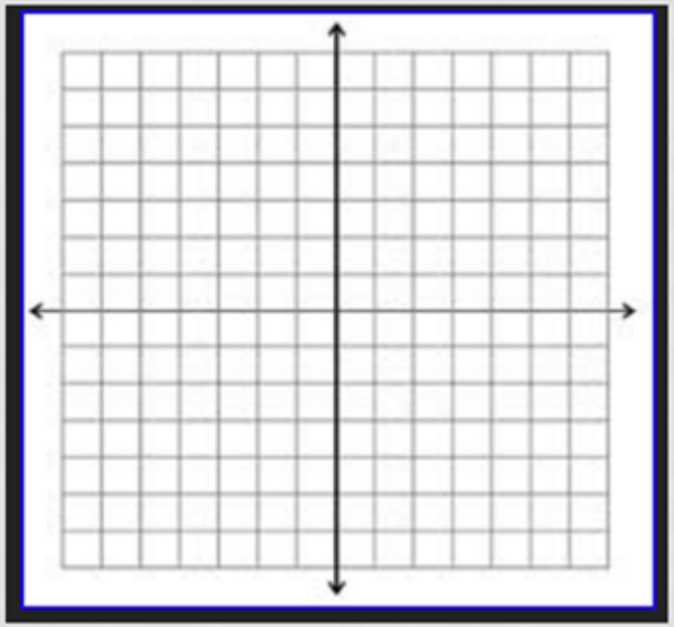
y-int

$(0, y)$

YOUR TURN

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

b) Graph the line.



EX 3 – DETERMINE SLOPE, GIVEN EQUATION IN GENERAL FORM

Determine the slope of the line with this equation:

$3x - 2y - 16 = 0$

+16 +16

Slope – int. form

$y = mx + b$

$-3x$

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

Alphabetical order

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

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

m

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

YOUR TURN

Determine the slope of the line with this equation:

$5x - 2y + 12 = 0$

$-12 \quad -12$ ⟸ change to slope-int. form

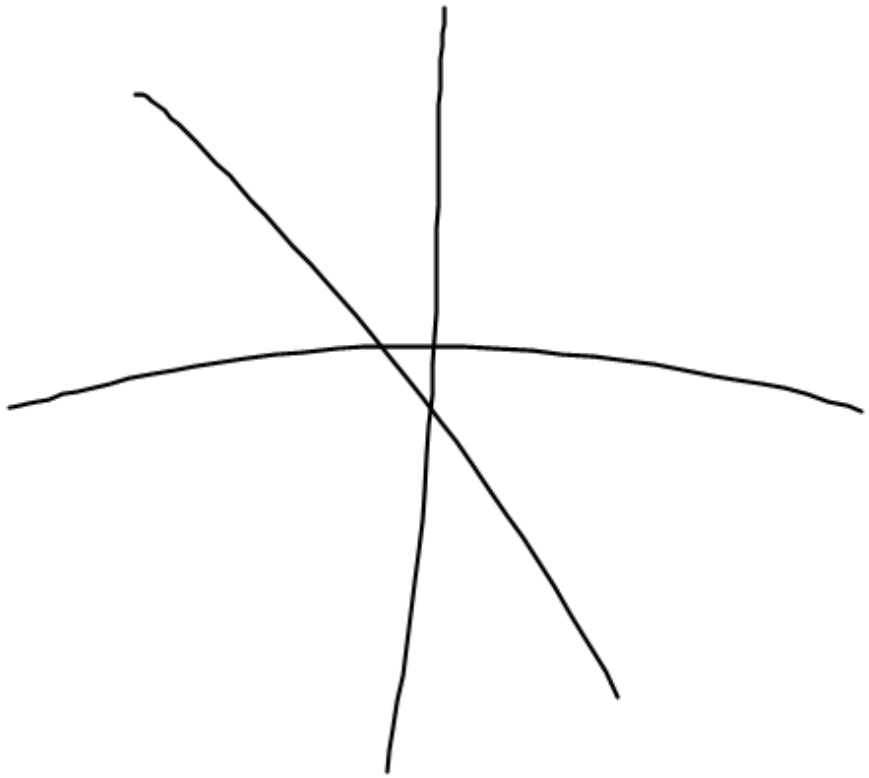
$-5x$

$5x - 2y = -12 - 5x$

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

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

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



ASSIGNMENT

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