4.5 notes

Friday, September 25, 2020   1:20 PM

Foundations and Precalculus 10

4.5 General Form of the Equation for a Linear Function

Notice: no 'm' or 'b' so doesn't give us slope or y-intercept.

must be positive.

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.

can be positive or negative.

Ex. 1: Write each equation in general form. ⟶ $Ax + By + C = 0$

① get rid of fractions: multiply by LCD (least common denominator)

② bring all terms to one side so:
→ A is positive
→ set equal to zero
→ in order: $Ax + By + C = 0$

General form:
→ A is positive ✓
→ no fractions ✓
→ right order and $= 0$ ✓

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

Aside
$\frac{3}{1}(-\frac{2}{3})$
$= -\frac{6}{3}$
$= -2$

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

$3y = -2x + 12$

$+2x \qquad +2x$

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

$\boxed{2x + 3y - 12 = 0}$

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

also must get rid of fractions here first!

Aside:
$\frac{5}{1}(\frac{3}{5})$
$= \frac{15}{5}$
$= 3$

$\frac{5}{1}(\frac{6}{5})$
$= \frac{30}{5}$
$= 6$

$5(y - 1 = \frac{3}{5}x + \frac{6}{5})$

$5y - 5 = 3x + 6$
$\quad +5 \qquad\quad +5$

$5y = 3x + 11$
$-5y \qquad -5y$

$\boxed{0 = 3x - 5y + 11}$ or $3x - 5y + 11 = 0$

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Ex. 2: Graph the line whose equation is $3x + 2y - 18 = 0$ by finding the x- and y-intercepts of the line.
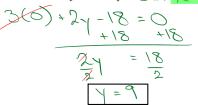
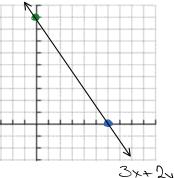Determine the x-intercept: let $y = 0$

$$3x + 2(0) - 18 = 0$$
$$3x \quad -18 = 0$$
$$\quad +18 \quad +18$$
$$\frac{3x}{3} = \frac{18}{3}$$
$$\boxed{x = 6}$$

Determine the y-intercept: let $x = 0$

$$3(0) + 2y - 18 = 0$$
$$\quad +18 \quad +18$$
$$\frac{2y}{2} = \frac{18}{2}$$
$$\boxed{y = 9}$$

$$3x + 2y - 18 = 0$$

Ex.3: Determine the slope of a line with the equation: $3x - 2y - 16 = 0$

$\rightarrow$ Get into $y = mx + b$ so isolate y.

$$3x - 2y - 16 = 0$$
$$+2y \qquad +2y$$
$$\frac{3x}{2} - \frac{16}{2} = \frac{2y}{2}$$
$$\frac{3}{2}x - 8 = y \qquad \boxed{m = \frac{3}{2}}$$

HW p384 #4,5ab,6-8,13ab,14ab,15,18