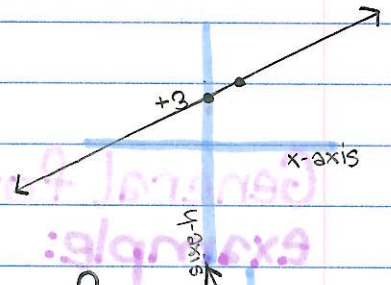
Sketching Linear Functions

- Linear functions are straight lines.

method 1: $y = \underset{\uparrow \frac{\text{rise}}{\text{run}}}{m}x + \underset{\text{y-intercept}}{b}$

example: $y = \underset{\uparrow \frac{\text{rise}}{\text{run}}}{\frac{1}{2}}x + \underset{\text{y-intercept}}{3}$



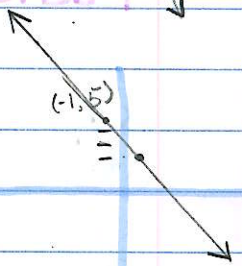
example 2: $y - 2 = -\frac{7}{3}x$ $\quad y = -\frac{7}{3}x + 2$

$+2 \qquad +2$

method 2: $y - y_1 = \underset{\uparrow \frac{\text{rise}}{\text{run}}}{m}(x - x_1)$ point (x_1, y_1)

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

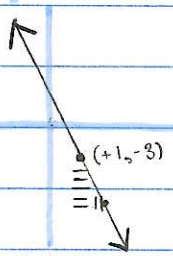
$+1, -5$ (point) → change signs = $(-1, +5)$



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

$+3 \qquad +3$ $\quad \uparrow \frac{\text{rise}}{\text{run}}$

$-1, +3$ (point) → change signs = $(+1, -3)$



method 3: $Ax + By = C$

- find the two intercepts & graph them.

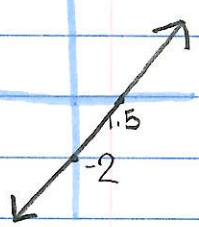
example: $4x - 3y = 6$

set $x = 0 \rightarrow \cancel{4x} - 3y = 6$ y-intercept

$-3 \quad -3$ $\quad = -2$

set $y = 0 \rightarrow \frac{4x}{4} - \cancel{3y} = \frac{6}{4}$ x-intercept

$= 1.5$



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