6.5: Slope-Point Form for Equation of a line

Recall: $y = mx + b$ (slope y-intercept form)

slope

y-intercept

Slope-point form

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

slope point (x_1, y_1)

Identify the slope & point from each equation.

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

slope $= \frac{2}{3}$ point $(1, 5)$

b) $y + 3 = -\frac{1}{2}(x - 7)$

slope $= -\frac{1}{2}$ point $(7, -3)$

c) $y - 5 = (x + 4)$

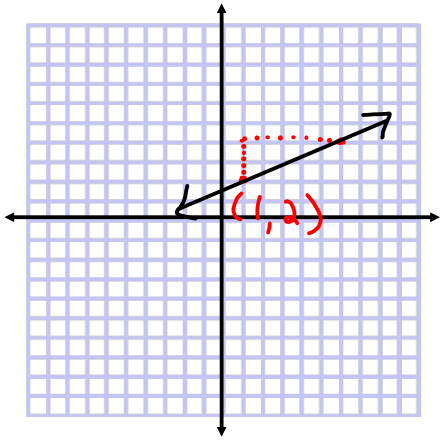
slope $= 1$ point $(-4, 5)$

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

slope $= -4$ point $(0, -\frac{2}{3})$

Sketching lines from slope-point form

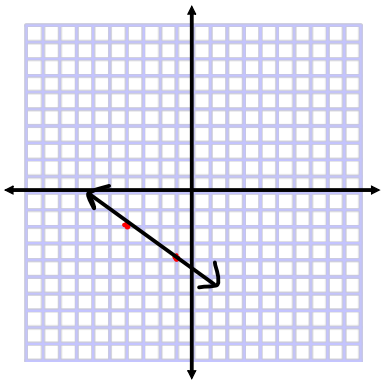
ex.1) $y-2=\frac{2}{5}(x-1)$



point $(1,2)$

slope $=\frac{2}{5}$ $\frac{(\text{rise})}{(\text{run})}$

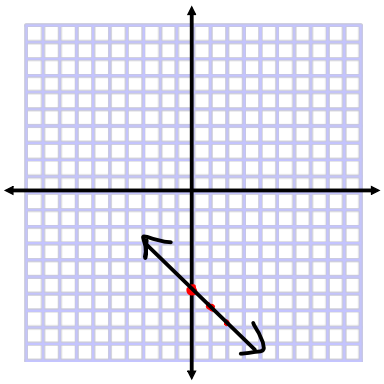
2) $y+2=-\frac{2}{3}(x+4)$



point $(-4,-2)$

slope $\frac{-2}{3}$

3) $y+6=-(x)$



slope $=-1$

point $(0,-6)$

* y-intercept!

slope $=\frac{-1}{1}$

$y=mx+b$

$y+6=-(x)$

$y=-x-6$

Changing from slope-point form to slope y-intercept form.

$y-y_1=m(x-x_1) \Rightarrow y=mx+b$

ex.1)

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

→ rid of the brackets by the distributive property

$y+1=2x-6$

→ isolate the "y"

$y=2x-6-1$

$y=2x-7$

2) $y+3=-4(x+1)$

$y+3=-4x-4$

$y=-4x-4-3$

$y=-4x-7$

3) $y+1=\frac{1}{2}(x-8)$

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

$y=\frac{1}{2}x-4-1$

$y=\frac{1}{2}x-5$

4) $y-5=-\frac{1}{3}(x-18)$

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

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

$y=-\frac{1}{3}x+11$

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

$y+3=\frac{3}{4}x-\frac{15}{4}$

$y=\frac{3}{4}x-\frac{15}{4}-3$

common denominator

$y=\frac{3}{4}x-\frac{15}{4}-\frac{12}{4}$

$y=\frac{3}{4}x-\frac{27}{4}$

(6) $y - 7 = -\frac{2}{5}(x - 2)$

$y - 7 = -\frac{2}{5}x + \frac{4}{5}$

$y = -\frac{2}{5}x + \frac{4}{5} + 7$

$y = -\frac{2}{5}x + \frac{4}{5} + \frac{35}{5}$

$y = -\frac{2}{5}x + \frac{39}{5}$