3.4 Writing An Equation Given Slope and a Point

Point Slope Form:

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

m = slope

(x_1, y_1) = point

*Do NOT replace y or x.

Examples: Write the equation of the line in slope intercept form.

1. $P(0, 6)$ and slope $= \frac{2}{3}$

Point

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

$y-6 = \frac{2}{3}(x-0)$

$y-6 = \frac{2}{3}x$

$\boxed{y = \frac{2}{3}x+6}$

2. $P(-5, 2)$ and slope $= -\frac{2}{5}$

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

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

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

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

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

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

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

3. $P(6, -1)$ and slope $= -2$

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

$y-1 = -2(x-6)$

$y+1 = -2(x)-2(-6)$

$y+1 = -2x+12$

$y = -2x+12-1$

$\boxed{y = -2x+11}$

4. $P(-3, 1)$ and slope $= \frac{4}{3}$

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

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

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

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

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

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

$\boxed{y = \frac{4}{3}x+5}$

5. $P(1, -4)$ and slope $= 0$

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

$y-4 = 0(x-1)$

$y+4 = 0$

$\boxed{y = -4}$

OR

horizontal

$y = \#\#$

$\boxed{y = -4}$

6. $P(-4, 1)$ and slope $= 3$

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

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

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

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

$y-1 = 3x+12$

$y = 3x+12+1$

$\boxed{y = 3x+13}$

HOMEWORK

Worksheet - HW 3.4 Writing Equations Given Slope and a Point