

Date: _____

5.1C Equation Writing in Slope-Intercept Form**Case I: Given slope and a point on the line**

- Substitute slope into slope intercept form
- Substitute in the point and solve for b

Ex. Determine the equation of the line, in slope-intercept form, with given slope and point:

a) $m = -2; (3, -1)$

$$y = mx + b$$

$$y = -2x + b$$

$$-1 = -2(3) + b$$

$$-1 = -6 + b$$

$$5 = b$$

$$\therefore y = -2x + 5$$

b) $m = \frac{2}{3}; (-2, 5)$

$$y = mx + b$$

$$y = \frac{2}{3}x + b$$

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

$$5 = -\frac{4}{3} + b$$

$$5 + \frac{4}{3} = b$$

$$\therefore y = \frac{2}{3}x + \frac{19}{3}$$

Case II: Given two points on the line

- Calculate slope using slope formula ($m = \frac{y_2 - y_1}{x_2 - x_1}$)
 - Substitute slope into slope intercept form
 - Substitute in the point and solve for b
- } Same as case I

Ex. Determine the equation of the line, in slope-intercept form, with given points:

a) $(-4, 7) \& (-6, 2)$

$$m = \frac{2 - 7}{-6 - (-4)} = \frac{-5}{-2} = \frac{5}{2}$$

$$y = mx + b$$

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

$$2 = \frac{5}{2}(-6) + b$$

$$2 = -15 + b$$

$$b = 17$$

$$\therefore y = \frac{5}{2}x + 17$$

$$7 = \frac{5}{2}(-4) + b$$

$$7 = -10 + b$$

$$b = 17$$

b) $(6, -1) \& (-2, 5)$

$$m = \frac{5 - (-1)}{-2 - 6} = \frac{6}{-8} = -\frac{3}{4}$$

$$y = mx + b$$

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

$$-1 = -\frac{3}{4}(6) + b$$

$$-1 = -\frac{9}{2} + b$$

$$-1 + \frac{9}{2} = b$$

$$b = \frac{7}{2}$$

$$\therefore y = -\frac{3}{4}x + \frac{7}{2}$$