

4.) $y = -\frac{1}{2}x + 5$. Find the perpendicular

$$\text{Slope} = -\frac{1}{2}$$

$$m_{\perp} = -\frac{1}{-1/2} = 2 = \text{perpendicular slope}$$

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

$$y - 1 = 2x - 4$$

$$y = 2x - 3$$

Parallel + Perpendicular Lines - Mini Test

Part A: Parallel

1. Line $y = -\frac{3}{2}x + 4$. Find the parallel line through $(2, -1)$.

$$\text{Slope} = -\frac{3}{2}$$

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

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

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

2. Line: $5x + 2y = 10$. Find parallel line through $(0, 3)$.

$$5x + 2y = 10$$

$$2y = -5x + 10$$

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

$$y - 3 = -\frac{5}{2}(x - 0)$$

$$y - 3 = -\frac{5}{2}x + 3$$

$$y = -\frac{5}{2}x + 3$$

Part B: Perpendicular

3. Line: $y = \frac{1}{3}x - 2$. Find the perpendicular line through $(-3, 0)$

$$y = \frac{1}{3}x - 2$$

$$m_{\perp} = -\frac{1}{m}$$

perpendicular slope
= -3

$$m_{\perp} = -\frac{1}{\frac{1}{3}} = -3$$

$$y - 0 = -3(x + 3)$$

$$y = -3x - 9$$

4. Line: $4x - y = 8$. Find perpendicular line through $(1, 5)$

$$-y = -4x + 8$$

$$\text{slope} = 4 \quad m_{\perp} = -\frac{1}{4} = -\frac{1}{4}$$

$$y = 4x - 8$$

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

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

$$y = -\frac{1}{4}x + \frac{21}{4}$$