Parallel and Perpendicular Lines Practice

Parallel Lines are have the ___Same___ slope but different ___y-intercepts___

1. Find the equation of a line parallel to the line: **y = 2x + 4**, through the point **(4, -3)**.

$$m_{\parallel} = 2 \qquad -3 = 2(4) + b$$
$$\underline{-3 = 8 + b} \qquad b = -11$$
$$-8 \quad -8$$

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

2. Find the equation of a line parallel to the line: **y = 3/4x – 12**, through the point **(8, 5)**.

$$m_{\parallel} = 3/4 \qquad 5 = 3/4(8) + b$$
$$\underline{5 = 6 + b}$$
$$-6 \quad -6 \qquad b = -1$$

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

3. Find the equation of a line parallel to the line: **-3x + y = 9**, through the point **(4, 6)**

$$y = 3x + 9$$
$$m_{\parallel} = 3 \qquad 6 = 3(4) + b$$
$$6 = 12 + b \qquad b = -6$$

$$\boxed{y = 3x - 6}$$

4. Find the equation of a line parallel to the line: **4x + 2y = -12**, through the point **(-6, 2)**

$$\frac{2y}{2} = \frac{-4x}{2} - \frac{12}{2} \qquad m = -2 \qquad 2 = -2(-6) + b$$
$$y = -2x - 6 \qquad\qquad 2 = 12 + b$$
$$-10 = b$$

$$\boxed{y = -2x - 10}$$

Perpendicular Lines are lines that have the slopes that are ___opposite reciprocals___.

5. Find the equation of a line perpendicular to the line: **y = 3x + 5**, through the point **(4, -3)**.

$$m_{\perp} = -1/3 \qquad -3 = -1/3(4) + b$$
$$-3 = -4/3 + b$$
$$\underline{+4/3 \quad +4/3}$$
$$-5/3 = b$$

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

6. Find the equation of a line parallel to the line: **y = 1/2x – 12**, through the point **(-8, 6)**.

$$m_{\perp} = -2 \qquad 6 = -2(-8) + b$$
$$6 = 16 + b$$
$$\underline{-16 \quad -16}$$
$$-10 = b$$

$$\boxed{y = -2x - 10}$$

7. Find the equation of a line parallel to the line: **-6x + 3y = 9**, through the point **(6, -2)**

$$\frac{3y}{3} = \frac{6x}{3} + \frac{9}{3} \qquad m_{\perp} = -1/2 \qquad -2 = -1/2(6) + b$$
$$y = 2x + 3 \qquad\qquad -2 = -3 + b$$
$$\underline{+3 \quad +3}$$
$$1 = b$$

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

8. Find the equation of a line parallel to the line: **5x + y = 10**, through the point **(-6, 2)**

$$y = -5x + 10 \qquad m_{\perp} = 1/5$$
$$2 = \frac{1}{5}(-6) + b$$
$$2 = -\frac{6}{5} + b$$
$$\underline{+\frac{6}{5} \quad +\frac{6}{5}} \qquad b = \frac{16}{5}$$

$$\boxed{y = \frac{1}{5}x + \frac{16}{5}}$$