

Parallel and Perpendicular Lines

Guided Notes

Throwback!

- **Slope-Intercept Form:**

$$y = mx + b$$

m = Slope of the line

b = y-intercept (y-coordinate of the point where the line crosses the y-axis)

- **Point-Slope Form:**

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

m = Slope of the line

(x_1, y_1) = point on the line

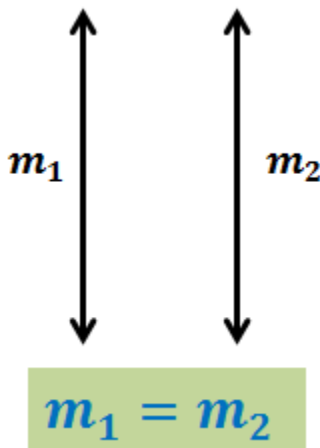
Parallel Lines

Two lines are parallel if they never intersect each other. Mathematically, two lines with slopes m_1 and m_2 are parallel if:

$$m_1 = m_2$$

To write the equation of a line parallel to a given line and passing through a point:

- Find the slope of the parallel line (two lines will have same slopes).
- Write the equation using the slope and the point.



Parallel and Perpendicular Lines

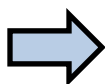
Guided Notes

Problem 1: Write an equation in slope-intercept form of the line passing through the point (4,3) and parallel to the graph of $y = 2x + 4$.

Perpendicular Lines

Two lines are perpendicular if they meet each other at right angles. Mathematically, two lines with slopes m_1 and m_2 are perpendicular if:

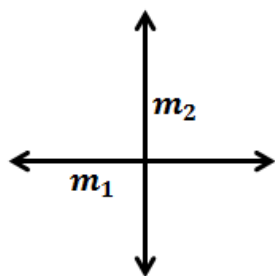
$$m_1 \times m_2 = -1$$



$$m_1 = -\frac{1}{m_2}$$

To write the equation of a line parallel to a given line and passing through a point:

- Find the slope of the perpendicular line (two lines will have slopes as negative reciprocals)
- Write the equation using the slope and the point.



$$m_1 \times m_2 = -1$$

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Parallel and Perpendicular Lines Guided Notes

Problem 2: Write an equation in slope-intercept form of the line passing through the point $(-1, 4)$ and perpendicular to the graph of $y = \frac{1}{3}x - 2$.