Mathematics: Perpendicular Line Formula, Solved Examples 1,2

Perpendicular Line Formula

A perpendicular line is a straight line through a point. It makes an angle of 90° with a particular point through which the line passes. Coordinates and line equation is the prerequisite to finding out the perpendicular line.

Consider the equation of the line is $ax + by + c = 0$ and coordinates are (x_1, y_1), the slope should *be* $-\frac{a}{b}$. If one line is perpendicular to this line, the product of slope should be -1. Let $m1$ and $m2$ be the slopes of two lines, then if they are perpendicular to each other.

Solved Examples

Question 1: Check whether $2x + 3y + 5 = 0$ and $3x - 2y + 1 = 0$ are perpendicular or not?

Solution:

The given equations of lines are, $2x + 3y + 5 = 0$ and $3x - 2y + 1 = 0$

To check whether they are perpendicular to each other, find out the slopes of both lines. If the product of the slope is -1, these lines are perpendicular to each other.

Slope equation is; $m = -\frac{a}{b}$

Slope for first line, $m_1 = -\frac{a}{b} = -\frac{2}{3}$

Slope for second line, $m_2 = -\frac{a}{b} = -\frac{3}{-2} = \frac{3}{2}$

So, $m_1 \times m_2 = -\frac{2}{3} \times \frac{3}{2} = -1$

Since the product of slope is -1, the given lines are perpendicular to each other.

Question 2: Check whether $3x + 5y + 6 = 0$ and $5x - 6y + 2 = 0$ are perpendicular or not?

Solution: The given equations of lines are, $3x + 5y + 6 = 0$ and $3x - 2y + 1 = 0$

To check whether they are perpendicular to each other, find out the slopes of both lines. If the product of the slope is -1, these lines are perpendicular to each other.

Slope equation is; $m = -\frac{a}{b}$

Slope for first line, $m_1 = -\frac{a}{b} = -\frac{3}{5}$

Slope for second line, $m_2 = -\frac{a}{b} = -\frac{5}{-6} =$

So, $m_1 \times m_2 = -\frac{3}{5} \times \frac{5}{6} = -\frac{1}{2}$

Since the product of slope is not -1, the given lines are not perpendicular to each other.