

Probability and Variables

Assignment 1

Mayuri Chourasia*
BT21BTECH11001

QUESTION 8 (B) ICSE 2019 PAPER

The vertices of a triangle ABC are A(3,8), B(-1,2) and C (6,-6). Find:

- (i) Slope of BC
- (ii) Equation of a line perpendicular to BC and passing through A.

ANSWER

PART 1:

Let (x_2, y_2) be the co-ordinates of point B(-1,2),

So,

$$x_2 = -1$$

$$y_2 = 2$$

Let (x_3, y_3) be the co-ordinates of point C(6,-6),

So,

$$x_3 = 6$$

$$y_3 = -6$$

To find the slope between two points, we use the slope point formula. For two points, (x_2, y_2) and (x_3, y_3) , the point-slope formula is given by:

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

Therefore, the slope of line BC will be given as:

$$\begin{aligned} \text{Slope} &= \frac{(-6) - 2}{(6 - (-1))} \\ &= \frac{-8}{7} \end{aligned}$$

PART 2:

Let slope of line perpendicular to BC be Slope(2), and let slope of line BC be Slope(1) we know that,

$$\begin{aligned} \text{Slope}(2) &= -\frac{1}{\text{Slope}(1)} \\ &= -\frac{1}{(-8/7)} \\ &= \frac{7}{8} \end{aligned}$$

In general case, for a line passing through a point (x_1, y_1) and having a slope m can be given by the equation :

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

Therefore, the equation of a line passing through the point A(3,8) and having a slope of 7/8 will be given as :

$$\begin{aligned} (y-8) &= 7/8(x-3) \\ 8(y-8) &= 7(x-3) \\ 8y-64 &= 7x-21 \\ 8y-7x &= 43 \end{aligned}$$

The equation of line perpendicular to B and passing through A(3,8) is
 $8y - 7x = 43$

The slope of line BC is -8/7.