Probability and Random Variables Assignment

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Question 8(B)
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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:

Slope = $\frac{(y_3-y_2)}{(x_3-x_2)}$

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

Slope = $\frac{(-6)-2)}{(6-(-1))}$

=$\frac{-8}{7}$

The slope of line BC is $\frac{-8}{7}$.

PART(2)

Let slope of line perpendicular to BC be Slope(2), and let slope of line BC be Slope(1)
we know that,
Slope(2) = - $\frac{1}{Slope(1}$

=$\frac{1}{\frac{-8}{7}}$

= 7/8

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 : (y – 8) = 7/8(x – 3)

8(y - 8)= 7(x – 3)

8y – 64 = 7x - 21

8y – 7x = 43

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