

AI1110 ASSIGNMENT-1

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QUESTION 7(C)

- (c) A(2, 5), B(-1, 2) and C(5, 8) are the vertices of a triangle ABC, 'M' is a point on AB such that $AM : MB = 1 : 2$. Find the co-ordinates of 'M'. Hence find the equation of the line passing through the points C and M.

SOLUTION:

According to the question, M is a point on the side AB such that

$$AM : MB = 1 : 2$$

It is known that,

When the line segment AB is divided internally by C in the ratio m:n, we use Section formula to find the point C.

The Coordinates of point C will be,

$$\left[\frac{mx_2 + nx_1}{m+n}, \frac{my_2 + ny_1}{m+n} \right], \text{ where } A(x_1, y_1), B(x_2, y_2)$$

From given data, using Section formula, we get

$$M = \left(\frac{-1 + 4}{1 + 2}, \frac{2 + 10}{1 + 2} \right) \\ = (1, 4)$$

The equation of the line joining two points (a,b),(c,d) is

$$(y - b) = \frac{d - b}{c - a}(x - a)$$

Here, the equation of the line joining C(5, 8) and M(1, 4) will be

$$(y - 4) = \frac{8 - 4}{5 - 1}(x - 1)$$

Simplified, we get the equation

$$x - y + 3 = 0$$

But, However,

On calculating, we get

The equation of the line joining A(2, 5), B(-1, 2) as $x - y + 3 = 0$ and the equation of the line joining B(-1, 2), C(5, 8) as $x - y + 3 = 0$ too.

This implies that A,B,C are 'collinear' and pass through $x - y + 3 = 0$ and hence, given points A, B, C don't form a triangle.

Verified by plotting the graph of A,B,C and M points :

