

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

From given data, using Section formula, we get

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

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.

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

