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, $[\frac{mx2+nx1}{m+n}, \frac{my2+ny1}{m+n}]$, where $A(x1, y1)$,$B(x2, y2)$

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 :