AI1110 ASSIGNMENT-1

CS21BTECH11024 - Jonnala Varshini

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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

$$AM : MB = 1 : 2$$

When the line segment AB is divided internally by C in the ratio m:n, from Section formula, we get the Coordinates of point C as,

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

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.

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

Graph of x-y+3=0 or 4x-4y+12=0