

CBSE CLASS 9

CHAPTER 7 : EXERCISE 1.8

1. In right triangle ABC , right angled at C , M is the mid-point of hypotenuse AB . C is joined to M and produced to a point D such that $DM = CM$. Point D is joined to point B see Fig. 1. Show that:

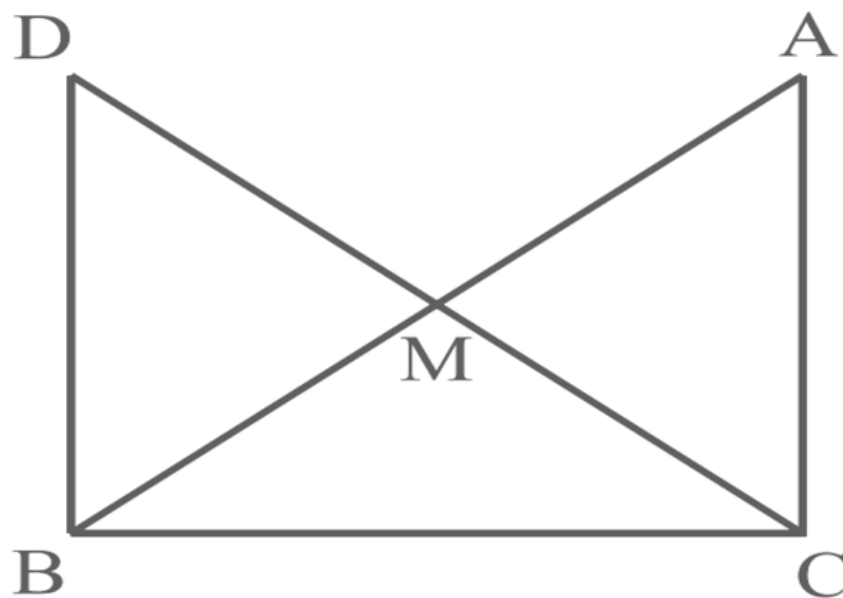


Figure 1: $\triangle ACB$, $\triangle DCB$ with Mid-Point M

- (i) $\triangle AMC \cong \triangle BMD$
- (ii) $\angle DBC$ is a right angle.
- (iii) $\triangle DBC \cong \triangle ACB$
- (iv) $CM = \frac{1}{2}AB$

Solution:

CONSTRUCTION STEPS :

(a) Let us Assume , the input parameters as ;

Parameter	Value	Description
θ	90°	$\angle \mathbf{DBC} = \angle \mathbf{ACB}$
\mathbf{B}	$\begin{pmatrix} 0 \\ 0 \end{pmatrix}$	Reference point at Origin
\mathbf{C}	$\begin{pmatrix} 6 \\ 0 \end{pmatrix}$	point \mathbf{C} on the same axis of \mathbf{B}

Table 1: Input Parameters

(b) the output can be calculated as ;

Parameter	Value	Description
l	$\ \mathbf{B} - \mathbf{C}\ $	Length of \mathbf{BC}
\mathbf{M}	$\left(\frac{\mathbf{A} + \mathbf{B}}{2}\right)$	Mid-point of \mathbf{AB}
\mathbf{D}	$\mathbf{B} + \begin{pmatrix} l \cos \theta \\ l \sin \theta \end{pmatrix}$	From point \mathbf{B} with an angle θ generating point \mathbf{D}
\mathbf{A}	$\mathbf{C} + \begin{pmatrix} -l \cos \theta \\ l \sin \theta \end{pmatrix}$	From point \mathbf{C} with an angle θ generating point \mathbf{A}

Table 2: Output Parameters

\therefore By, Plotting these points we get the required Image Fig. 2

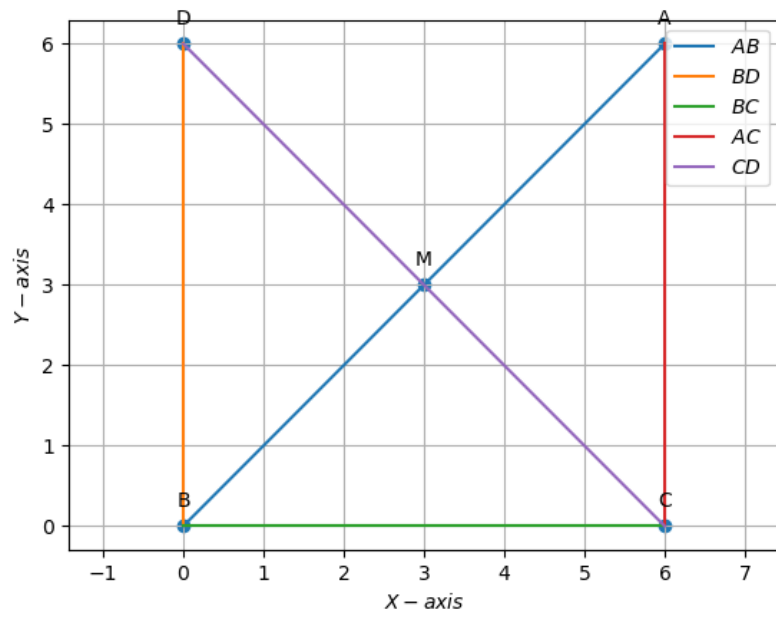


Figure 2: PYTHON Plot of $\triangle ACB, \triangle DCB$ with Mid-Point **M**