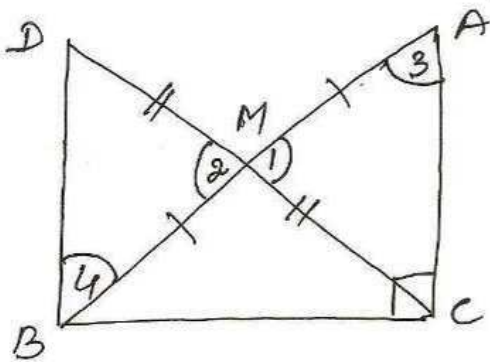


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To show $\triangle AMC \cong \triangle BMD$

$$\angle DBC = 90^\circ$$

$$\triangle DBC \cong \triangle ACB$$

$$CM = \frac{1}{2} AB$$

Proof In $\triangle AMC$ and $\triangle BMD$

$$AM = BM \text{ (given)}$$

$$\angle 1 = \angle 2 \text{ (V.O.As)}$$

$$CM = DM \text{ (given)}$$

$\therefore \triangle AMC \cong \triangle BMD$ by SAS prop.

$$AC = BD \text{ (cpct)}$$

$$\angle 3 = \angle 4$$

But these are alt. interior angles

$$\therefore AC \parallel DB$$

$$\angle ACB + \angle DBC = 180^\circ \text{ [Co. Int. Angs]}$$

$$90^\circ + \angle DBC = 180^\circ$$

$$\Rightarrow \angle DBC = 180^\circ - 90^\circ$$

$$= 90^\circ$$

In $\triangle DBC$ and $\triangle ACB$

$$DB = AC$$

$$\angle DBC = \angle ACB = 90^\circ$$

$$BC = CB$$

$\therefore \triangle DBC \cong \triangle ACB$

by SAS prop.

$$DC = AB \text{ (cpct)}$$

$$\frac{1}{2} DC = \frac{1}{2} AB$$

$$CM = \frac{1}{2} AB \text{ [}\because CM = DM\text{]}$$