

Solution For School Geometry Problems

Yogesh Choudhary

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Question

1 Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of $\triangle PQR$. Show that:

1 $\triangle ABM \cong \triangle PQN$

2 $\triangle ABC \cong \triangle PQR$

Figures

Let assume we have two triangles as follows→

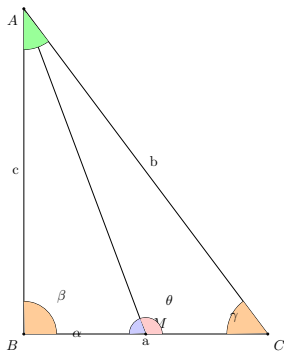


Figure: a

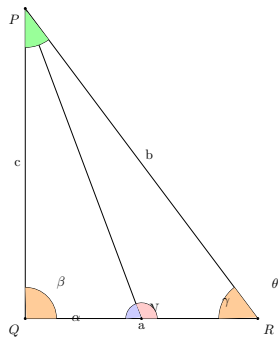


Figure: b

Ans.1

given that \rightarrow

$$AB = PQ \quad (1)$$

$$AM = PN \quad (2)$$

$$BC = QR \quad (3)$$

from equation (3)...

$$\frac{BC}{2} = \frac{QR}{2} \quad (4)$$

$$BM = QN \quad (5)$$

from fig [1] and [2] ...

$$AB = PQ \quad (6)$$

$$AM = PN \quad (7)$$

$$BM = QN \quad (8)$$

$$\implies \triangle ABM \cong \triangle PQN \quad (9)$$

Ans.2

given that \rightarrow

$$AM = PN \quad (10)$$

from equation (3)...

$$\frac{BC}{2} = \frac{QR}{2} \quad (11)$$

$$MC = NR \quad (12)$$

from equation (9)...

$$\triangle ABM \cong \triangle PQN \quad (13)$$

$$\implies \angle AMB = \angle PNQ \quad (14)$$

$$180 - \angle AMB = 180 - \angle PNQ \quad (15)$$

$$\angle AMC = \angle PNR \quad (16)$$

from equation (10),(12) and (16)...

$$AM = PN \quad (17)$$

$$MC = NR \quad (18)$$

$$\angle AMC = \angle PNR \quad (19)$$

$$\implies \triangle AMC \cong \triangle PNR \quad (20)$$

$$\implies AC = PR \quad (21)$$

from equation (1),(3) and (21)...

$$AB = PQ \quad (22)$$

$$BC = QR \quad (23)$$

$$AC = QR \quad (24)$$

$$\implies \triangle ABC \cong \triangle PQR \quad (25)$$