Solution For School Geometry Problems

May 20, 2020

Ques. **Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of Δ PQR.Show that:**

(a) Δ ABM $\cong$ Δ PQN

(b) Δ ABC $\cong$ Δ PQR

Ans. (a) Let assume we have two triangles as follows$\rightarrow$

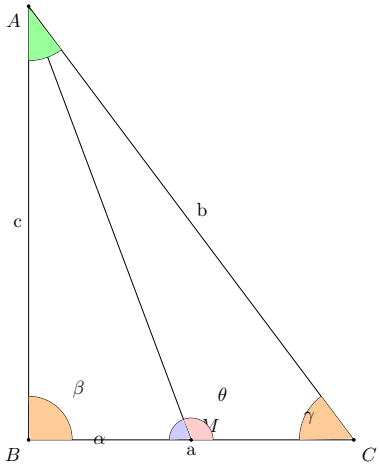

Figure 1: Δ ABC

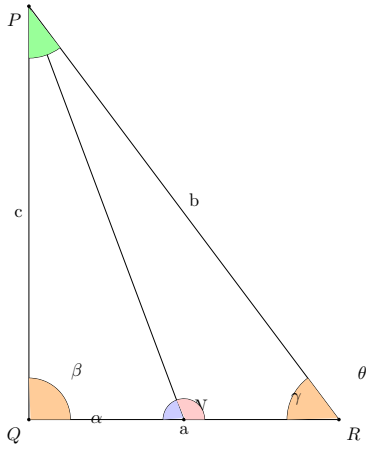

Figure 2: Δ PQR

given that $\rightarrow$

$$AB = PQ \tag{1}$$
$$AM = PN \tag{2}$$
$$BC = QR \tag{3}$$

from equation (3)...

$$\frac{BC}{2} = \frac{QR}{2} \tag{4}$$
$$BM = QN \tag{5}$$

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

$$AB = PQ \tag{6}$$
$$AM = PN \tag{7}$$
$$BM = QN \tag{8}$$
$$\implies \Delta ABM \cong \Delta PQN \tag{9}$$

(b) given that $\rightarrow$

$$AM = PN \tag{10}$$

from equation (3)...

$$\frac{BC}{2} = \frac{QR}{2} \tag{11}$$
$$MC = NR \tag{12}$$

from equation (9)...

$$\Delta ABM \cong \Delta PQN \tag{13}$$
$$\implies \angle AMB = \angle PNQ \tag{14}$$
$$180 - \angle AMB = 180 - \angle PNQ \tag{15}$$
$$\angle AMC = \angle PNR \tag{16}$$

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

$$AM = PN \tag{17}$$
$$MC = NR \tag{18}$$
$$\angle AMC = \angle PNR \tag{19}$$
$$\implies \Delta AMC \cong \Delta PNR \tag{20}$$
$$\implies AC = PR \tag{21}$$

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

$$AB = PQ \tag{22}$$
$$BC = QR \tag{23}$$
$$AC = QR \tag{24}$$
$$\implies \Delta ABC \cong \Delta PQR \tag{25}$$