Solution For The School Geometry Problems

Yogesh Choudhary

***Abstract*—This document includes different problems and solution on geometry from trigonometry and algebra.It also provides the imformation about the python and latex codes of figures.**

Download all python codes from

svn co https://github.com/yogi13995/yogesh_training/tree/master/Geometry/codes

and latex-tikz codes from

svn co https://github.com/yogi13995/yogesh_training/tree/master/Geometry/figures

1 Problem

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 ≅ Δ PQN

b) Δ ABC ≅ Δ PQR

Ans. a) Let assume we have two triangles as follows→

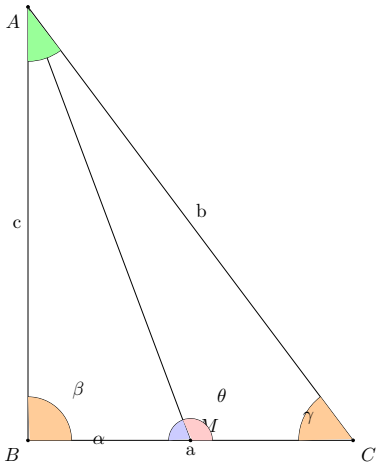

Figure 1.0.1: Δ ABC

./figures/congurentpicabc.pdf

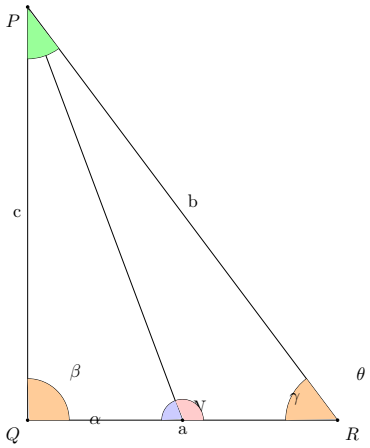

Figure 1.0.2: Δ PQR

./figures/congurentpicabc2.pdf

given that →

$$AB = PQ \tag{1.0.1}$$
$$AM = PN \tag{1.0.2}$$
$$BC = QR \tag{1.0.3}$$

from equation (1.0.3)...

$$\frac{BC}{2} = \frac{QR}{2} \tag{1.0.4}$$
$$BM = QN \tag{1.0.5}$$

from fig [1.0.1] and [1.0.2] ...

$$AB = PQ \tag{1.0.6}$$
$$AM = PN \tag{1.0.7}$$
$$BM = QN \tag{1.0.8}$$
$$\implies \Delta ABM \cong \Delta PQN \tag{1.0.9}$$

b) given that →

$$AM = PN \tag{1.0.10}$$

from equation (1.0.3)...

$$\frac{BC}{2} = \frac{QR}{2} \tag{1.0.11}$$
$$MC = NR \tag{1.0.12}$$

from equation (1.0.9)...

$$\Delta ABM \cong \Delta PQN \tag{1.0.13}$$
$$\implies \angle AMB = \angle PNQ \tag{1.0.14}$$
$$180 - \angle AMB = 180 - \angle PNQ \tag{1.0.15}$$
$$\angle AMC = \angle PNR \tag{1.0.16}$$

from equation (1.0.10),(1.0.12) and (1.0.16)...

$$AM = PN \tag{1.0.17}$$
$$MC = NR \tag{1.0.18}$$
$$\angle AMC = \angle PNR \tag{1.0.19}$$
$$\implies \Delta AMC \cong \Delta PNR \tag{1.0.20}$$
$$\implies AC = PR \tag{1.0.21}$$

from equation (1.0.1),(1.0.3) and (1.0.21)...

$$AB = PQ \tag{1.0.22}$$
$$BC = QR \tag{1.0.23}$$
$$AC = QR \tag{1.0.24}$$
$$\implies \Delta ABC \cong \Delta PQR \tag{1.0.25}$$