

Exercise 8.1

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Abstract—This document provides the solution to the problem no. 36 given in the exercise 8.1. The problem is based on the congruence rules in triangles. The figures are provided using python and \LaTeX codes.

For figures, download the code from

svn co <https://github.com/mohit-singh-9/Summer-2020.git>

I. PROBLEM No. 36

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:

- $\triangle ABM \cong \triangle PQN$
- $\triangle ABC \cong \triangle PQR$

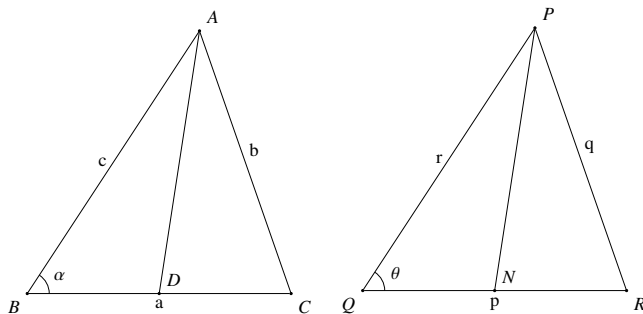


Fig. 1: $\triangle ABC$ and $\triangle PQR$ using Latex

II. CONSTRUCTION

Download the python code from

`./codes/triangle_python.py`

and latex code from

`./fig/triangle_fig.tex`

The triangles in the Fig 1 and Fig 2 are constructed with the following length of sides:

In $\triangle ABC$: $AB = BC = 6$ cm, $AC = 5$ cm. M is the midpoint of BC. So, AD is the median.

In $\triangle PQR$: $PQ = QR = 6$ cm, $PR = 5$ cm. N is the midpoint of QR. So, PN is the median.

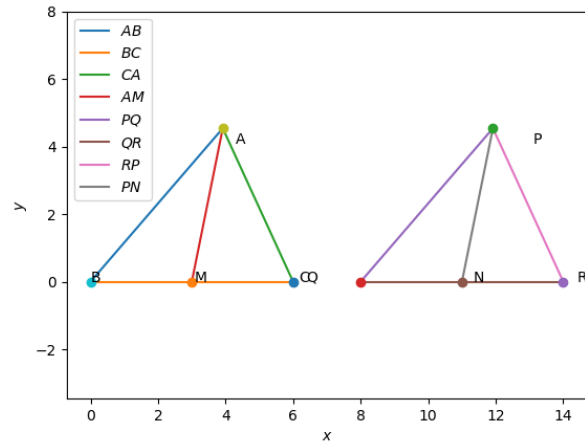


Fig. 2: $\triangle ABC$ and $\triangle PQR$ using Python

III. SOLUTION

a)

In $\triangle ABM$ and $\triangle PQN$

$AB = PQ$ (Given)

$AM = PN$ (Given)

Since M and N are midpoints and $BC = QR$,
 $BM = QR$

\therefore By SSS congruence rule, $\triangle ABM \cong \triangle PQN$

So now $\angle ABM = \angle PQN$ i.e $\alpha = \theta$

b)

Now in $\triangle ABC$ and $\triangle PQR$

$AB = PQ$ (Given)

$\alpha = \theta$

$BC = QR$ (Given)

\therefore By SAS congruence rule, $\triangle ABC \cong \triangle PQR$