

## EXERCISE 6.2

Is the triangle with sides 25 cm, 5 cm and 24 cm a right triangle? Give reason for your answer. Solution:

**False**

According to the question,

Let us assume that,

$$A = 25 \text{ cm}$$

$$B = 5 \text{ cm}$$

$$C = 24 \text{ cm}$$

Now, Using Pythagoras Theorem,

We have,

$$A^2 = B^2 + C^2$$

$$B^2 + C^2 = (5)^2 + (24)^2$$

$$B^2 + C^2 = 25 + 576$$

$$B^2 + C^2 = 601$$

$$A^2 = 600$$

$$600 \neq 601$$

$$A^2 \neq B^2 + C^2$$

Since the sides does not satisfy the property of Pythagoras theorem, triangle with sides 25cm, 5cm and 24cm is not a right triangle.

1. It is given that  $\triangle DEF \sim \triangle RPQ$ . Is it true to say that  $\angle D = \angle R$  and  $\angle F = \angle P$  ? Why?

Solution:

**False**

We know that,

Corresponding angles are equal in similar triangles.

So, we get,

$$\angle D = \angle R$$

$$\angle E = \angle P$$

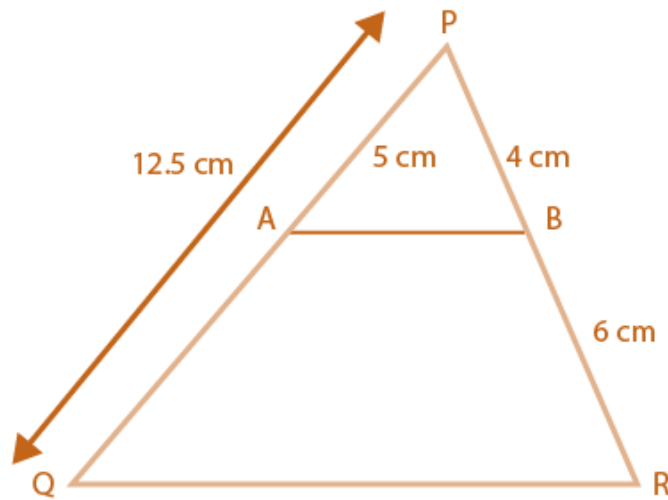
$$\angle F = \angle Q$$

2. A and B are respectively the points on the sides PQ and PR of a  $\triangle PQR$  such that  $PQ = 12.5 \text{ cm}$ ,  $PA = 5 \text{ cm}$ ,  $BR = 6 \text{ cm}$  and  $PB = 4 \text{ cm}$ . Is  $AB \parallel QR$ ? Give reason for your answer.

Solution:

**True**

According to the question,



$$PQ = 12.5 \text{ cm}$$

$$PA = 5 \text{ cm}$$

$$BR = 6 \text{ cm}$$

$$PB = 4 \text{ cm}$$

Then,

$$QA = QP - PA = 12.5 - 5 = 7.5 \text{ cm}$$

So,

$$PA/AQ = 5/7.5 = 50/75 = 2/3 \dots (i)$$

$$PB/BR = 4/6 = 2/3 \dots (ii)$$

Form Equations (i) and (ii).

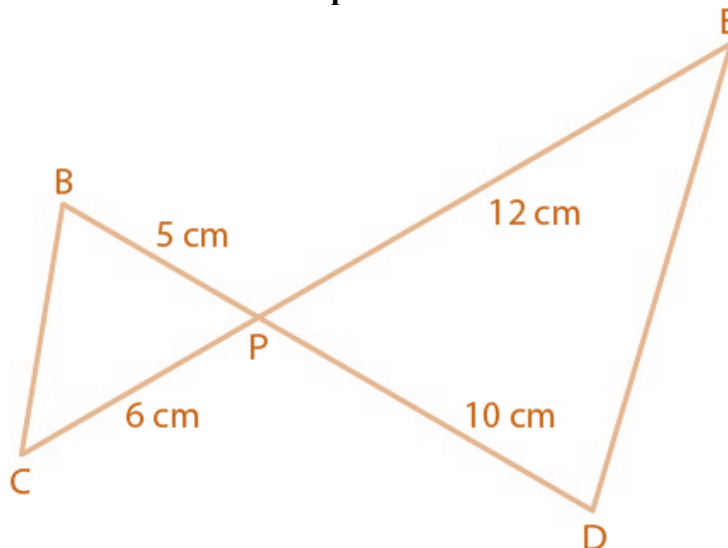
$$PA/AQ = PB/BR$$

We know that, if a line divides any two sides of a triangle in the same ratio, then the line is parallel to the third side.

Therefore,

$$AB \parallel QR.$$

3. In figure, BD and CE intersect each other at the point P. Is  $\Delta PBC \sim \Delta PDE$ ? Why?



**Solution:**

**True**

In  $\Delta PBC$  and  $\Delta PDE$ ,

$\angle BPC = \angle EPD$  [vertically opposite angles]

$PB/PD = 5/10 = \frac{1}{2} \dots$  (i)

$PC/PE = 6/12 = \frac{1}{2} \dots$  (ii)

From equation (i) and (ii),

We get,

$$PB/PD = PC/PE$$

Since,  $\angle BPC$  of  $\Delta PBC = \angle EPD$  of  $\Delta PDE$  and the sides including these.

Then, by SAS similarity criteria

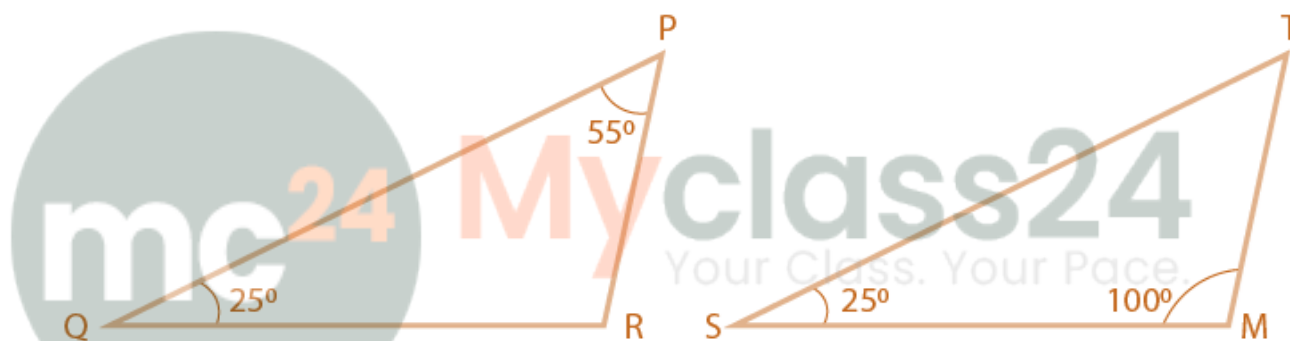
$\Delta PBC \sim \Delta PDE$

**4. In  $\Delta PQR$  and  $\Delta MST$ ,  $\angle P = 55^\circ$ ,  $\angle Q = 25^\circ$ ,  $\angle M = 100^\circ$  and  $\angle S = 25^\circ$ . Is  $\Delta QPR \sim \Delta TSM$ ? Why?**

**Solution:**

We know that,

Sum of the three angles of a triangle =  $180^\circ$ .



Then, from  $\Delta PQR$ ,

$$\angle P + \angle Q + \angle R = 180^\circ$$

$$55^\circ + 25^\circ + \angle R = 180^\circ$$

So, we get,

$$\angle R = 180^\circ - (55^\circ + 25^\circ) = 180^\circ - 80^\circ = 100^\circ$$

Similarly, from  $\Delta TSM$ ,

$$\angle T + \angle S + \angle M = 180^\circ$$

$$\angle T + 25^\circ + 100^\circ = 180^\circ$$

So, we get,

$$\angle T = 180^\circ - (\angle 25^\circ + 100^\circ)$$

$$\angle T = 180^\circ - 125^\circ = 55^\circ$$

In  $\Delta PQR$  and  $\Delta TSM$ ,

We have,

$$\angle P = \angle T,$$

$$\angle Q = \angle S$$

$$\angle R = \angle M$$

Hence,  $\Delta PQR \sim \Delta TSM$

Since, all corresponding angles are equal,

$\Delta QPR$  is similar to  $\Delta TSM$ ,

5. Is the following statement true? Why?

“Two quadrilaterals are similar, if their corresponding angles are equal”.

**Solution:**

**False**

Two quadrilaterals cannot be similar, if only their corresponding angles are equal



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