Also, it is given that

$$\angle PST = \angle PRQ (2)$$

So,

$$\angle PRQ = \angle PQR \quad \text{[From (1) and (2)]}$$

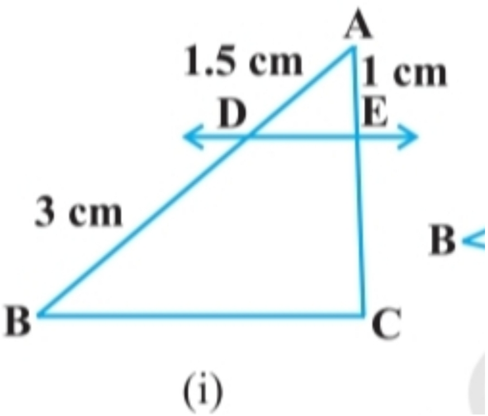
Therefore,

$$PQ = PR \quad \text{(Sides opposite the equal angles)}$$

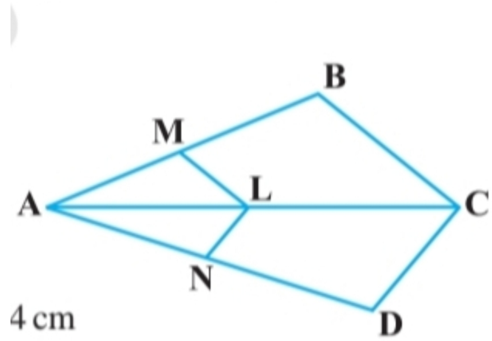
i.e., PQR is an isosceles triangle.

EXERCISE 6.2

1. In Fig. 6.17, (i) and (ii), DE || BC. Find EC in (i) and AD in (ii).



(i)



(ii)

2. E and F are points on the sides PQ and PR respectively of a $\triangle PQR$. For each of the following cases, state whether EF || QR :

(i) PE = 3.9 cm, EQ = 3 cm, PF = 3.6 cm and FR = 2.4 cm

(ii) PE = 4 cm, QE = 4.5 cm, PF = 8 cm and RF = 9 cm

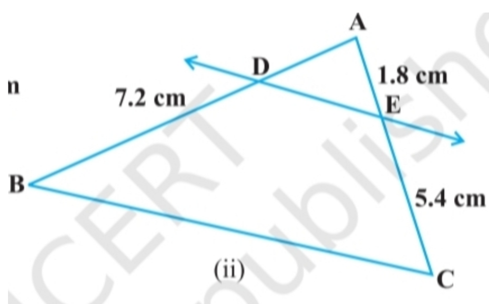
(iii) PQ = 1.28 cm, PR = 2.56 cm, PE = 0.18 cm and PF = 0.36 cm

3. In Fig. 6.18, if LM || CB and LN || CD, prove that

$$\frac{AM}{AB} = \frac{AN}{AD}$$

4. In Fig. 6.19, DE || AC and DF || AE. Prove that

$$\frac{BF}{FE} = \frac{BE}{EC}$$



5. In Fig. 6.20, DE || OQ and DF || OR. Show that EF || QR.

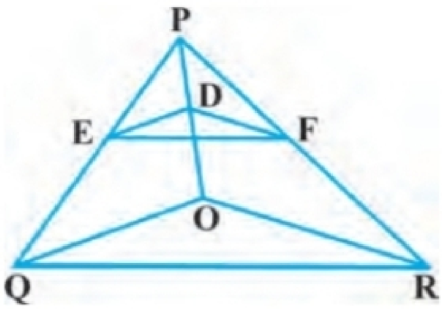


Fig. 6.20

6. In Fig. 6.21, A, B and C are points on OP, OQ and OR respectively such that AB || PQ and AC || PR. Show that BC || QR.

7. Using Theorem 6.1, prove that a line drawn through the mid-point of one side of a triangle parallel to another side bisects the third side. (Recall that you have proved it in Class IX.)

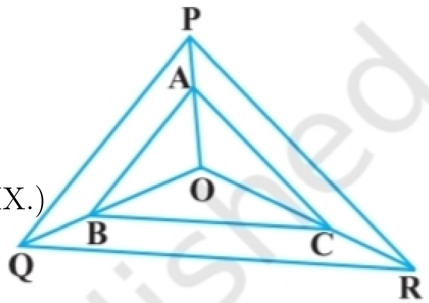


Fig. 6.21

8. Using Theorem 6.2, prove that the line joining the mid-points of any two sides of a triangle is parallel to the third side. (Recall that you have done it in Class IX.)

9. ABCD is a trapezium in which AB || DC and its diagonals intersect each other at the point O. Show that

$$\frac{AO}{BO} = \frac{CO}{DO}$$

10. The diagonals of a quadrilateral ABCD intersect each other at the point O such that

$$\frac{AO}{BO} = \frac{CO}{DO}$$

Show that ABCD is a trapezium.

6.4 Criteria for Similarity of Triangles

In the previous section, we stated that two triangles are similar, if (i) their corresponding angles are equal and (ii) their corresponding sides are in the same ratio (or proportion). That is, in $\triangle ABC$ and $\triangle DEF$, if

(i) $\angle A = \angle D$, $\angle B = \angle E$, $\angle C = \angle F$

(ii) $\dfrac{AB}{DE} = \dfrac{BC}{EF} = \dfrac{CA}{FD}$

then the two triangles are similar (see Fig. 6.22).