SOLVED EXAMPLE
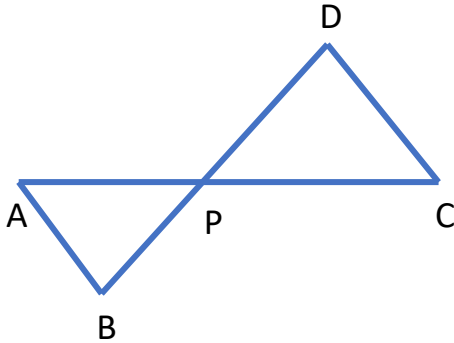
1) In the given figure AC and BD intersect each other at point P and $\frac{AP}{CP} = \frac{BP}{DP}$.
Prove that $\triangle ABP \sim \triangle CDP$

Solution:

Given: $\frac{AP}{CP} = \frac{BP}{DP}$

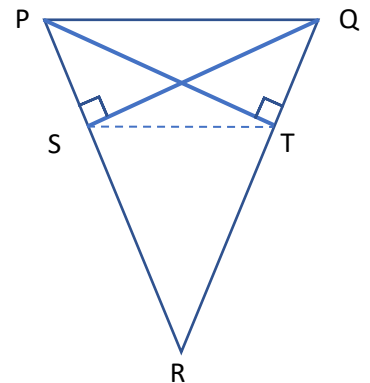To prove: $\triangle ABP \sim \triangle CDP$

Proof:

In $\triangle ABP$ and $\triangle CDP$, $\frac{AP}{CP} = \frac{BP}{DP}$ (Given)

$\angle APB = \angle CPD$ (Vertically opposite angles)

Therefore, by SAS similarity, $\triangle ABP \sim \triangle CDP$

2) The given figure shows $\triangle PQR$ in which PT and QS are altitudes drawn on the sides RQ and PR respectively. In $\triangle PQR$, the relation $SR \times PQ = x \times ST$ is satisfied. Which of the following is the value of x

   a. RQ
   b. RT
   c. PT
   d. QT

Solution:

In $\triangle PTR$ and $\triangle QSR$,

$\angle PTR = \angle QSR = 90°$ and $\angle R$ is common

Therefore, $\triangle PTR \sim \triangle QSR$ (by AA similarity)

$\Rightarrow \frac{PR}{QR} = \frac{TR}{SR}$ (Corresponding sides of similar triangles)

Therefore, $\frac{PR}{TR} = \frac{QR}{SR}$

$\Rightarrow \triangle PQR \sim \triangle TSR$ (By SAS similarity with common $\angle R$)
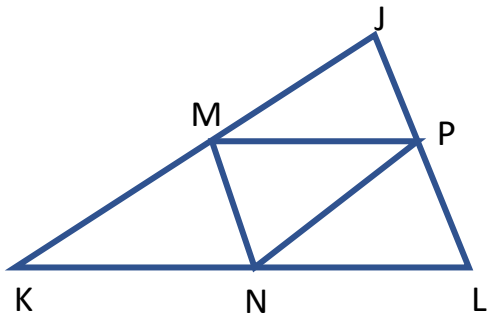
$$\Rightarrow \frac{PQ}{TS} = \frac{QR}{SR} \text{ (Corresponding sides of similar triangles)}$$
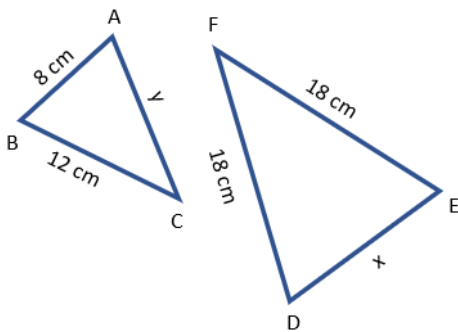$$\Rightarrow SR \times PQ = RQ \times ST$$

Thus, the value of x is RQ

Solve the following:

1) The ratio of the corresponding sides of two triangles ABC and PQR is 1:3. If $\angle P = 55°$ and $\angle Q = 30°$, what is the measure of $\angle C$?
2) In the adjoining figure, M is the midpoint of $\overline{JK}$, N is the midpoint of $\overline{KL}$ and P is the midpoint of $\overline{JL}$. Prove that ΔJKL ~ Δ NPM

3) In the adjoining figure, find x and y given ΔABC~ΔDEF

4) In the following figure, find x and y given ΔPQR~ΔXYZ
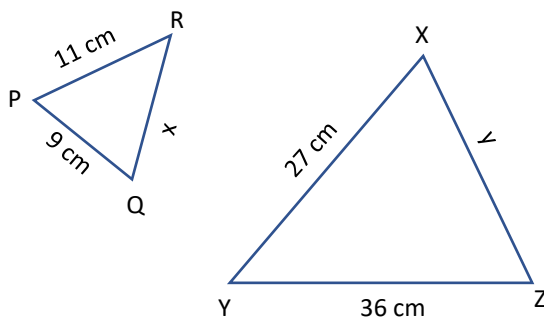
5) Using the following information, answer the question.
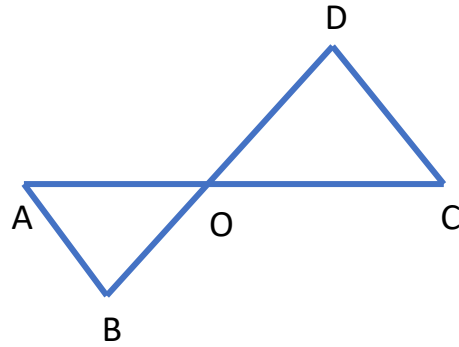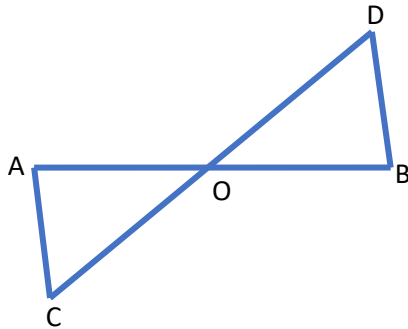
AO = 2.8 cm

BO = 2.6 cm

AB = 2.5 cm

DO = 5.6 cm

CD = 5 cm

CO = 5.2 cm

$\angle A = 65°$ and $\angle BOC = 125°$.

What is the measure of $\angle C$?

6) In the given figure line segments AC and DB are parallel. Line segment AB divides line segment CD such that CO:OD = 3:4. The length of OB is given as 12 cm. What is the length of AB?

7) The given figure shows a parallelogram PQRS. T is a point on side SR such that ST:TR = 5:2. PT is extended and intersects QR at A. If PB = 70cm, then what is the length of AB