

# Basic Proportionality Theorem for a Triangle

## Objective

To verify the basic proportionality theorem by using parallel lines board, triangle cut outs.

## Basic Proportionality Theorem

If a line is drawn parallel to one side of a triangle, to intersect the other two sides at distinct points, the other two sides are divided in the same ratio.

## Prerequisite Knowledge

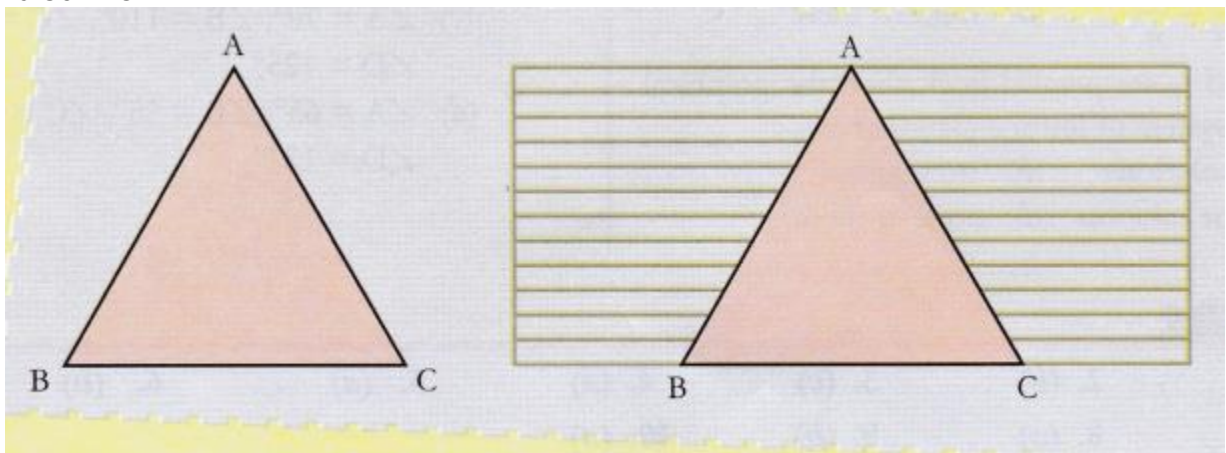
1. Statement of Basic Proportionality theorem.
2. Drawing a line parallel to a given line which passes through a given point.

## Materials Required

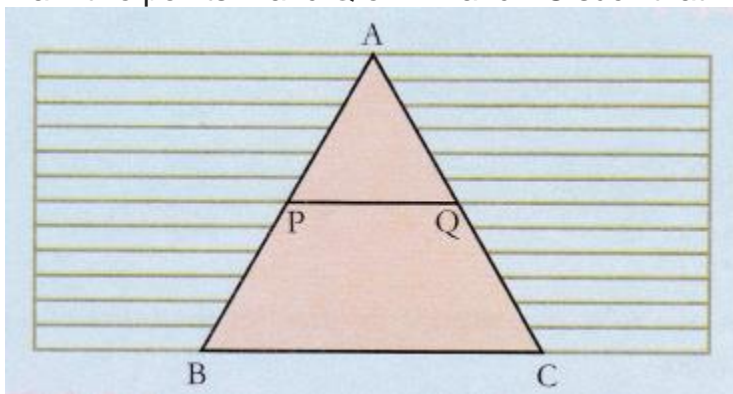
White chart paper, coloured papers, geometry box, sketch pens, fevicol, a pair of scissors, ruled paper sheet (or Parallel line board).

## Procedure

1. Cut an acute-angled triangle say ABC from a coloured paper.
2. Paste the  $\triangle ABC$  on ruled sheet such that the base of the triangle coincides with ruled line.



- Mark two points P and Q on AB and AC such that  $PQ \parallel BC$ .



- Using a ruler measure the length of AP, PB, AQ and QC.
- Repeat the same for right-angled triangle and obtuse-angled triangle.
- Now complete the following observation table.

### Observation

Triangle ABC	Length of the segments				$\frac{AP}{PB}$	$\frac{AQ}{QC}$	Equal/Not equal
	AP	PB	AQ	QC			
Acute							
Obtuse							
Right							

### Result

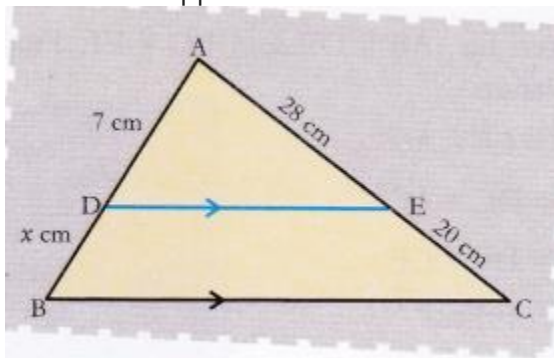
In each set of triangles, we verified that  $\frac{AP}{PB} = \frac{AQ}{QC}$

### Learning Outcome

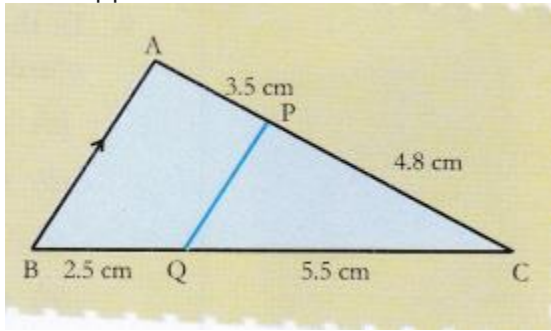
Students will observe that in all the three triangles the Basic Proportionality theorem is verified.

### Activity Time

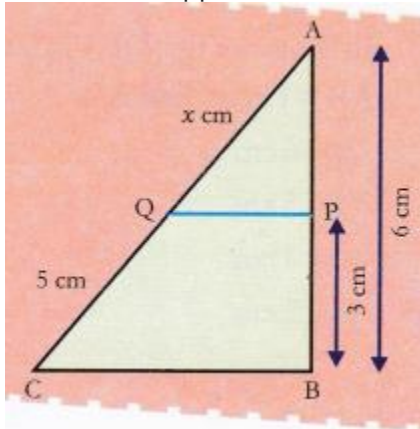
- Find x if  $DE \parallel BC$ .



2. Is  $PQ \parallel AB$  ?



3. Find  $x$  if  $PQ \parallel BC$



**Viva Voce**

**Question 1.**

Is there any other name for B.P.T. (Basic Proportionality Theorem) ?

**Answer:**

Yes, Thales Theorem

**Question 2.**

Name the mathematician who gave B.P.T.

**Answer:**

Greek mathematician Thales

**Question 3.**

What is the statement of B.P.T. ?

**Answer:**

If a line is drawn parallel to one side of a triangle to intersect the other two sides at distinct points, the other two sides are divided in the same ratio.

**Question 4.**

Can we prove Mid-point theorem by using B.P.T. ?

**Answer:**

Yes

**Question 5.**

Is the B.P.T. applicable for a scalene triangle ?

**Answer:**

Yes

**Question 6.**

What is the converse of B.P.T. ?

**Answer:**

If a line divides any two sides of a triangle in the same ratio, the line is parallel to the third side of the triangle.

**Question 7.**

Give two different examples of pairs of similar figures.

**Answer:**

Pair of squares, pair of circles

**Question 8.**

What are the conditions for two polygons of same number of sides to be similar ?

**Answer:**

1. Their corresponding angles are equal.
2. Their corresponding sides are proportional.

### Multiple Choice Questions

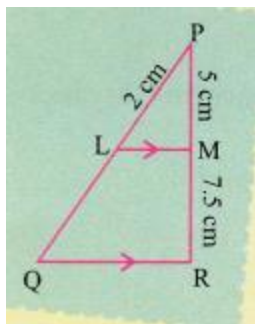
**Question 1.**

In  $\triangle ABC$ , if  $DE \parallel BC$ ,  $AD = 3.2$ ,  $DB = 1.6$ ,  $AE = x$  and  $EC = 2.1$ , then  $x$  is

- (a) 4.2
- (b) 3.2
- (c) 1.6
- (d) 4.8

**Question 2.**

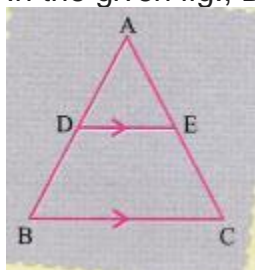
In the given fig.,  $LM \parallel QR$ . Find  $LQ$



- (a) 3.1 cm
- (b) 2.5 cm
- (c) 3 cm
- (d) None of these

**Question 3.**

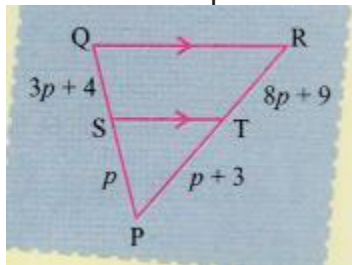
In the given fig.,  $DE \parallel BC$ . If  $\frac{AE}{AC} = \frac{2}{5}$  and  $AB = 15$  cm, find  $AD$ .



- (a) 6 cm
- (b) 5 cm
- (c) 4 cm
- (d) 7 cm

**Question 4.**

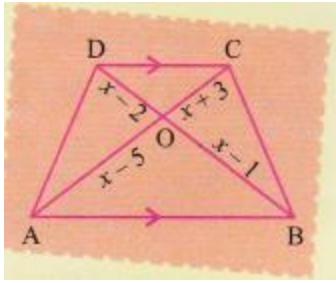
What value of  $p$  will make  $ST \parallel QR$  in the given fig. ?



- (a) 2
- (b) 3
- (c) 5
- (d) None of these

**Question 5.**

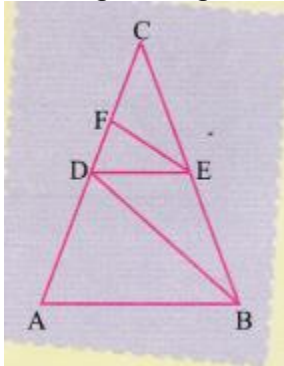
Find  $x$ , if  $DC \parallel AB$ .



- (a) 7
- (b) 3
- (c) 5
- (d) None of these

**Question 6.**

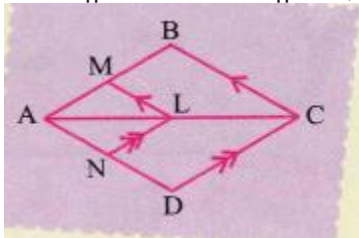
In the given fig.,  $AB \parallel DE$  and  $BD \parallel EF$ . Find the correct relation.



- (a)  $DC^2 = CF \times AC$
- (b)  $CF^2 = DC \times AC$
- (c)  $AC^2 = DC \times CF$
- (d) None of these

**Question 7.**

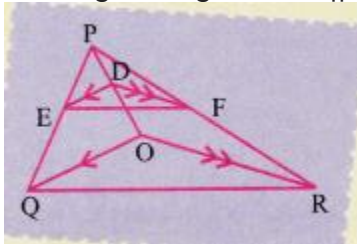
If  $LM \parallel CB$  and  $LN \parallel CD$ , then choose the correct answer



- (a)  $\frac{AM}{AB} = \frac{AN}{AD}$
- (b)  $\frac{AM}{AB} = \frac{AD}{AN}$
- (c)  $\frac{AB}{AM} = \frac{AN}{AD}$
- (d)  $\frac{AM}{AB} \neq \frac{AN}{AD}$

**Question 8.**

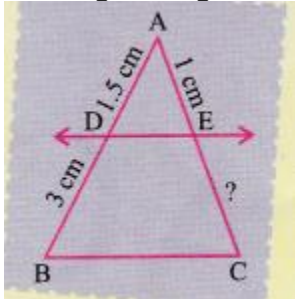
In the given figure,  $DE \parallel OQ$  and  $DF \parallel OR$ , then which is the correct relation ?



- (a)  $EF = \frac{1}{2} QR$
- (b)  $EF \neq QR$
- (c)  $EF = QR$
- (d)  $EF \parallel QR$

**Question 9.**

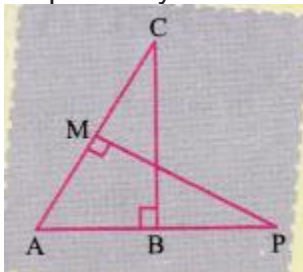
In the given figure  $DE \parallel BC$ , then EC is



- (a) 2 cm
- (b) 1.5 cm
- (c) 1 cm
- (d) 3 cm

**Question 10.**

In the given figure ABC and AMP are two right triangles, right angled at B and M respectively. Then tick the correct answer.



- (a)  $\frac{CA}{PA} = \frac{BC}{MP}$
- (b)  $\frac{CA}{PA} \neq \frac{BC}{MP}$
- (c)  $\frac{CA}{PA} = \frac{MP}{BC}$
- (d)  $\frac{CA}{PA} \neq \frac{MP}{BC}$

## Answers

1. (a)
2. (c)
3. (a)
4. (a)
5. (d)
6. (a)
7. (a)
8. (d)
9. (a)
10. (a)