

Maxprep. Chapter wise Series Class 10th - Mathematics

Class : 10th

Topic : Triangle

Max. Marks : 50

Duration : 2 Hrs

Sections: A (MCQs), B (Short Answer-I), C (Short Answer-II), D (Long Answer), E (Case-Based).

General Instructions:

- All questions are compulsory.
- This question paper contains 23 questions divided into five Sections A, B, C, D and E.
- Section A comprises of 10 MCQs of 1 mark each. Section B comprises of 5 questions of 2 marks each. Section C comprises of 4 questions of 3 marks each. Section D comprises of 2 question of 5 marks each and Section E comprises of 2 Case Study Based Questions of 4 marks each.
- There is no overall choice.
- Use of Calculators is not permitted.
- Draw the appropriate diagram if needed. (use scale and pencil.)

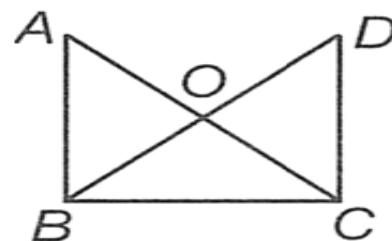
Section A

1. If in two triangles ABC and DEF, $\frac{AB}{DE} = \frac{BC}{FE} = \frac{CA}{FD}$, then

- $\triangle CBA \sim \triangle FDE$
- $\triangle FDE \sim \triangle CAB$
- $\triangle FDE \sim \triangle ABC$
- $\triangle BCA \sim \triangle FDE$

2. In the given figure, $\triangle ABC \sim \triangle DCB$, then $AB \times DB =$

- $DC \times AC$
- $AB \times DC$
- $OB \times OC$
- $OA \times OD$



3. If in $\triangle ABC$ and $\triangle DEF$, $\frac{AB}{DE} = \frac{BC}{FD}$, then $\triangle ABC \sim \triangle DEF$ when

- $\angle B = \angle E$
- $\angle B = \angle D$
- $\angle A = \angle F$
- $\angle A = \angle D$

4. If the diagonals of a quadrilateral divide each other proportionally then it is a

- square
- parallelogram
- trapezium
- rectangle

5. It is given that $\triangle ABC \sim \triangle DEF$. If $\angle A = 55^\circ$, $\angle E = 45^\circ$, then $\angle C$ is:

- 55°
- 90°
- 45°
- 80°

6. If $\triangle ABC$ and $\triangle DEF$ are similar such that $2 AB = DE$ and $BC = 8\text{cm}$, then $EF =$

- 8 cm
- 12 cm
- 16 cm
- 4 cm

7. The perimeters of two similar triangles ABC and PQR are 56 cm and 48 cm respectively.

$\frac{PQ}{AB}$ is equal to

- $\frac{7}{8}$
- $\frac{7}{6}$
- $\frac{6}{7}$
- $\frac{8}{7}$

8. If in two triangles ABC and PQR, $\angle A = \angle Q$ and $\angle R = \angle B$, then which of the following will be NOT true.

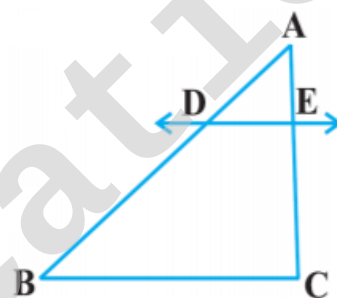
- a) $\frac{AB}{QR} = \frac{AC}{PQ}$ b) $\frac{BC}{PR} = \frac{AC}{PQ}$ c) $\frac{BC}{RP} = \frac{AB}{QR}$ d) $\frac{AB}{PQ} = \frac{BC}{RP}$

Assertion(A)/Reason(R) Based (9-10): In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- a) Both A and R are true and R is the correct explanation of A.
 b) Both A and R are true but R is not the correct explanation of A.
 c) A is true but R is false.
 d) A is false but R is true.

9. Assertion (A): D and E are points on the sides AB and AC respectively of a $\triangle ABC$ such that $AD = 5.7$ cm, $DB = 9.5$ cm, $AE = 4.8$ cm and $EC = 8$ cm then DE is not parallel to BC .

Reason (R): If a line divides any two sides of a triangle in the same ratio then it is parallel to the third side.



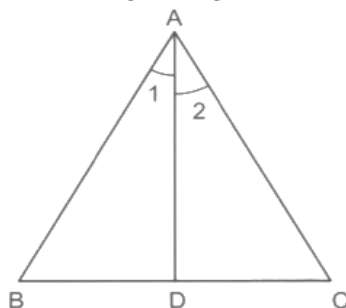
10. Assertion (A): D and E are points on the sides AB and AC respectively of a $\triangle ABC$ such that $DE \parallel BC$ then the value of x is 4, when $AD = x$ cm, $DB = (x - 2)$ cm, $AE = (x + 2)$ cm and $EC = (x - 1)$ cm.

Reason (R): If a line is parallel to one side of a triangle then it divides the other two sides in the same ratio.

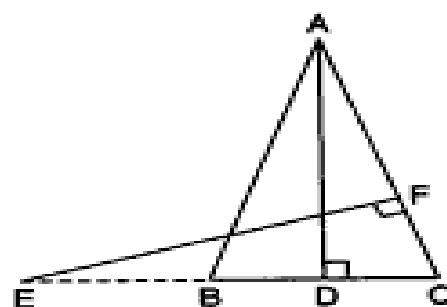
SECTION – B

Questions 11 to 15 carry 2 marks each

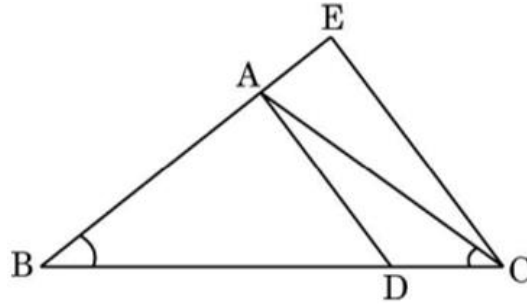
11. In Fig. $\triangle ABC$ is a triangle such that $\frac{AB}{AC} = \frac{BD}{DC}$, $\angle B = 70^\circ$, $\angle C = 50^\circ$ Find $\angle BAD$.



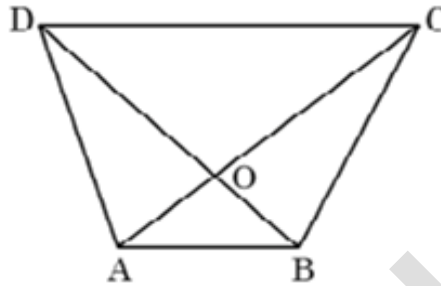
12. In the figure, E is the point on side CB produced on an isosceles triangle ABC with $AB = AC$. If $AD \perp BC$ and $EF \perp AC$, prove that $\triangle ABD \sim \triangle ECF$.



13. In the given figure, $\frac{BC}{BD} = \frac{BE}{AC}$ and $\angle ABD = \angle ACD$. Show that $\triangle ABD \sim \triangle EBC$.



14. The diagonals of a quadrilateral ABCD intersect each other at the point O such that $\frac{AO}{BO} = \frac{CO}{DO}$. Show that quadrilateral ABCD is a trapezium.



15. D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$. Show that $CA^2 = CB \cdot CD$.

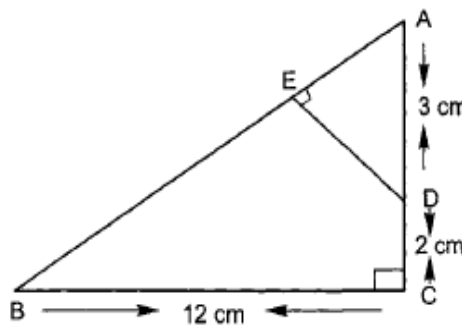
SECTION – C

Questions 16 to 19 carry 3 marks each

16. CD and GH are respectively the bisectors of $\angle ACB$ and $\angle EGF$ such that D and H lie on sides AB and FE of $\triangle ABC$ and $\triangle EFG$ respectively. If $\triangle ABC \sim \triangle FEG$, show that:

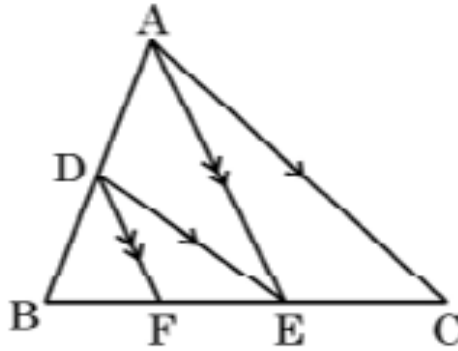
- $\frac{CD}{GH} = \frac{AC}{FG}$
- $\triangle DCB \sim \triangle HE$
- $\triangle DCA \sim \triangle HGF$

17. In Fig. $\triangle ABC$ is right angled at C and $DE \perp AB$. Prove that $\triangle ABC \sim \triangle ADE$ and hence find the lengths of AE and DE.



18. E is a point on the side AD produced of a $\parallel$ gm ABCD and BE intersects CD at F. Show that $AB \times BC = AE \times CF$.

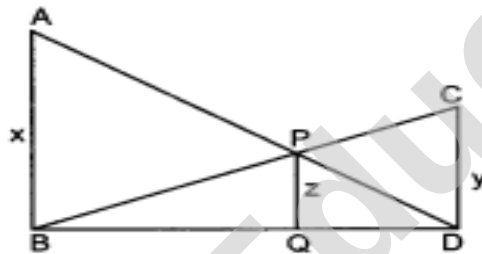
19. In the given figure, $DE \parallel AC$ and $DF \parallel AE$, Prove that $\frac{BF}{FE} = \frac{BE}{EC}$



SECTION – D

Questions 20 to 21 carry 5 marks each

20. In figure $AB \parallel PQ \parallel CD$, $AB = x$ units, $CD = y$ units and $PQ = z$ units, prove that $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$



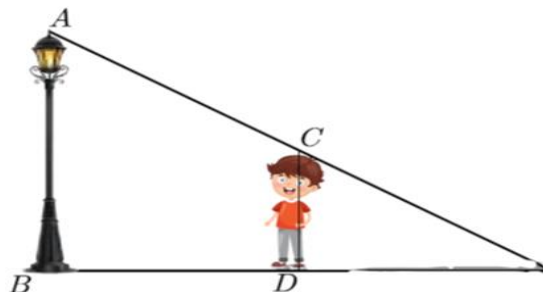
21. Sides AB and AC and median AM of a $\triangle ABC$ are proportional to sides DE and DF and Median DN of another $\triangle DEF$. Show that $\triangle ABC \sim \triangle DEF$.

SECTION – E (Case Study Based Questions)

Questions 22 & 23 carry 4 marks each

22. Read the following text carefully and answer the questions that follow:

Abhrodeep is very intelligent in maths. He always try to relate the concept of maths in daily life. One day he is walking away from the base of a lamp post at a speed of 1 m/s. Lamp is 4.5 m above the ground.



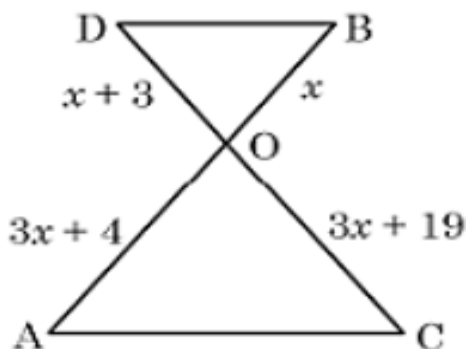
- If after 2 second, length of shadow is 1 meter, what is the height of Abhrodeep? (1)
- What is the minimum time after which his shadow will become larger than his original height? (1)
- What is the distance of Abhrodeep from pole at this point? (2)

OR

- What will be the length of his shadow after 4 seconds? (2)

23. Read the following text carefully and answer the questions that follow:

In the figure given below, a folding table is shown:



The legs of the table are represented by line segments AB and CD intersecting at O. Join AC and BD.

Considering table top is parallel to the ground, and $OB = x$, $OD = x + 3$, $OC = 3x + 19$ and $OA = 3x + 4$, answer the following questions:

- Prove that $\triangle OAC$ is similar to $\triangle OBD$.
- Prove that $\frac{OA}{AC} = \frac{OB}{BD}$
- Observe the figure and find the value of x . Hence, find the length of OC.

OR

Observe the figure and find $\frac{BD}{AC}$.

Triangle Paper Details – Analysis		
Objective Questions		
MCQ	1 marks x 8 question = 8	
Assertion Reason	1 marks x 2 question = 2	
Subjective		
Short type I	2 marks x 5 question = 10	
Short type II	3 marks x 4 question = 12	
Long Type	5 marks x 2 question = 10	
Case Studies Based		
Case 1	4 marks	
Case 2	4 marks	

Total = 50 marks Your Score =