

Time : 1 Hour 30 Minute

STD 10 Maths

Total Marks : 50

Chapter Based Test

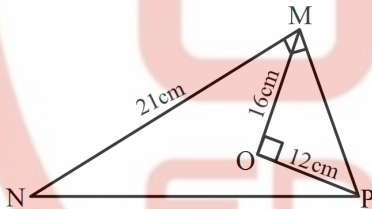
Section A

* Choose the right answer from the given options. [1 Marks Each] [7]

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

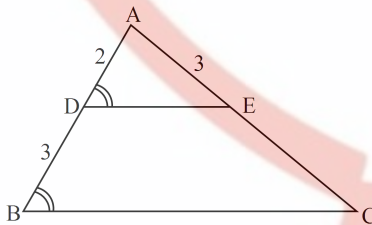
- (A) $\triangle FDE \sim \triangle ABC$ (B) $\triangle BCA \sim \triangle FDE$ (C) $\triangle FDE \sim \triangle CAB$ (D) $\triangle CBA \sim \triangle FDE$

2. In the given figure, O is a point inside a $\triangle MNP$ such that $\angle MOP = 90^\circ$, $OM = 16\text{cm}$ and $OP = 12\text{cm}$. If $MN = 21\text{cm}$ and $\angle NMP = 90^\circ$ then $NP = ?$



- (A) 25cm (B) 29cm (C) 33cm (D) 35cm

3. In the given figure if $\angle ADE = \angle ABC$, $\angle ADE = \angle ABC$, then CE is equal to:



- (A) 3. (B) $\frac{9}{2}$ (C) 2. (D) 5.

4. In $\triangle ABC$, if $AB = 16\text{cm}$, $BC = 12\text{cm}$ and $AC = 20\text{cm}$, then $\triangle ABC$ is:

- (A) Acute-angled. (B) Right-angled. (C) Obtuse-angled. (D) Not possible.

5. If ABC is a right triangle right-angled at B and M, N are the mid-points of AB and BC respectively, then $4(AN^2 + CM^2) =$

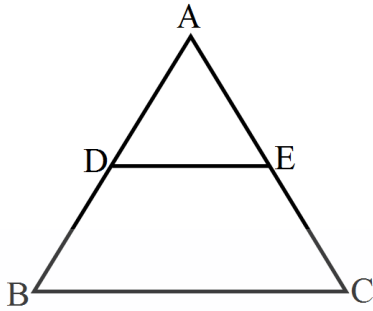
- (A) $4AC^2$ (B) $5AC^2$ (C) $\frac{5}{4}AC^2$ (D) $6AC^2$

6. $\triangle ABC \sim \triangle DEF$ and their perimeters are 32cm and 24cm respectively. If $AB = 10\text{cm}$ then $DE = ?$

- a. 8cm
b. 7.5cm
c. 15cm
d. $5\sqrt{3}\text{cm}$

7.

In an equilateral $\triangle ABC$, D is the midpoint of AB and E is the midpoint of AC. Then, $ar(\triangle ABC) : ar(\triangle ADE) = ?$



- a. 2 : 1
- b. 4 : 1
- c. 1 : 2
- d. 1 : 4

* A statement of Assertion (A) is followed by a statement of Reason (R). [3]

Choose the correct option.

8. **DIRECTION:** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

Assertion: In $\triangle ABC$, $AB = 6\sqrt{3}$, $AC = 12\text{cm}$ and $BC = 6\text{cm}$ then $2B = 90^\circ$.

Reason: If in a triangle, square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle.

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

9. **DIRECTION:** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

Assertion: $\triangle ABC \sim \triangle DEF$ such that $ar(\triangle ABC) = 36\text{cm}^2$? and $ar\triangle DEF = 49\text{cm}^2$?. Then, the ratio of their corresponding sides is 6:7

Reason: The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

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

10. **DIRECTION:** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

Assertion: 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 $AD = x\text{ cm}$, $DB = (x - 2)\text{cm}$, $AE = (x + 2)\text{ cm}$ and $EC = (x - 1)\text{cm}$.

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

- Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- Assertion (A) is true but reason (R) is false.
- Assertion (A) is false but reason (R) is true

* **State whether the following sentences are True or False. [1 Marks Each] [2]**

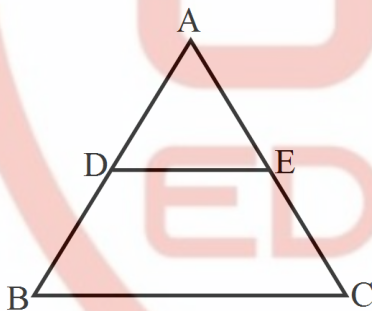
- Write the truth value (T/F) of the following statements:
Two polygons are similar, if their corresponding angles are proportional.
- Write the truth value (T/F) of the following statements:
Any two similar figures are congruent.

* **Answer the following questions in one sentence. [1 Marks Each] [2]**

- D, E and F are the mid-points of the sides AB, BC and CA respectively of $\triangle ABC$.

Find $\frac{\text{ar}(\triangle DEF)}{\text{ar}(\triangle ABC)}$

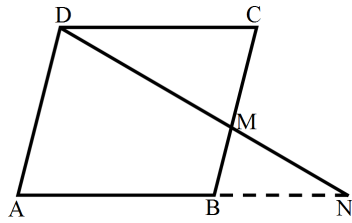
- In fig., $DE \parallel BC$, $AD = 1\text{cm}$ and $BD = 2\text{cm}$. what is the ratio of the ar $\triangle ABC$ to the ar $(\triangle ADE)$?



Section B

* **Given section consists of questions of 2 marks each. [10]**

- Diagonal AC and BD of a trapezium ABCD with $AB \parallel DC$ intersect each other at point O. Using a similarity criterion for two triangles, show that $\frac{OA}{OC} = \frac{OB}{OD}$.
- In $\triangle ABC$, points P and Q are on CA and CB, respectively such that $CA = 16\text{cm}$, $CP = 10\text{cm}$, $CB = 30\text{cm}$ and $CQ = 25\text{cm}$. Is $PQ \parallel AB$?
- Triangle ABC and DEF are similar.
If area $(\triangle ABC) = 9\text{cm}^2$, area $(\triangle DEF) = 64\text{cm}^2$ and $DE = 5.1\text{cm}$, find AB.
- In $\triangle ABC$, AD is the bisector of $\angle A$, Meeting side BC at D.
If $BD = 2.5\text{cm}$, $AB = 5\text{cm}$ and $AC = 4.2\text{cm}$, find DC.
- M is a point on the side BC of a parallelogram ABCD. DM when produced meet AB produced at N. Prove that.
 - $\frac{DM}{MN} = \frac{DC}{BN}$
 - $\frac{DN}{DM} = \frac{AN}{DC}$

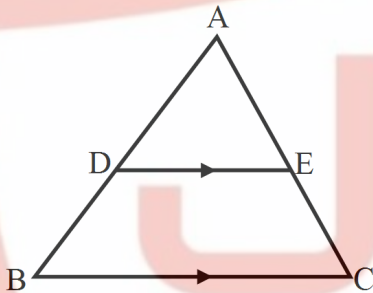


Section C

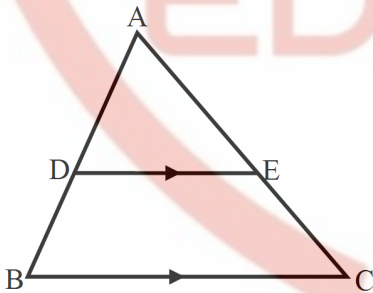
* Given section consists of questions of 3 marks each.

[12]

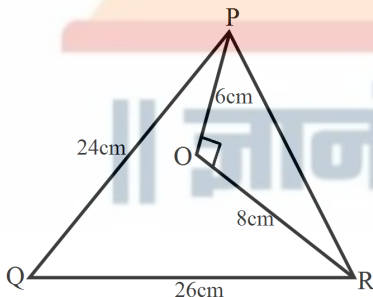
1. If $\triangle ABC$ and $\triangle DEF$ are two triangles such that $\frac{AB}{DE} = \frac{BC}{EF} = \frac{CA}{FD} = \frac{3}{4}$, then write $\text{Area}(\triangle ABC) : \text{Area}(\triangle DEF)$.
2. D and E are points on the sides AB and AC respectively of a $\triangle ABC$ such that $DE \parallel BC$:
 $AD = (7x - 4)\text{cm}$, $AE = (5x - 2)\text{cm}$, $DB = (3x + 4)\text{cm}$ and $EC = 3x\text{ cm}$.



3. D and E are points on the sides AB and AC respectively of a $\triangle ABC$ such that $DE \parallel BC$:
 If $AD = 3.6\text{cm}$, $AB = 10\text{cm}$ and $AE = 4.5\text{cm}$, find EC and AC.



4. In the given figure, O is a point inside a $\triangle PQR$ such that $\angle PQR = 90^\circ$, $OP = 6\text{cm}$ and $OR = 8\text{cm}$. If $PQ = 24\text{cm}$ and $QR = 26\text{cm}$, prove that $\triangle PQR$ is right-angled.



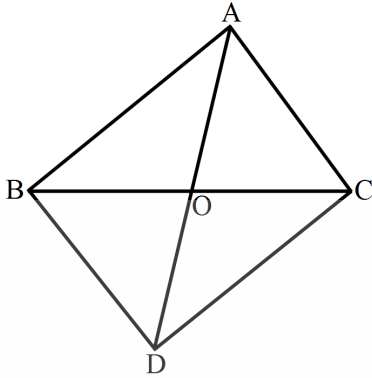
Section D

* Given section consists of questions of 5 marks each.

[10]

- 1.

In the given figure, $\triangle ABC$ and $\triangle DBC$ have the same base BC. If AD and BC intersect at O, prove that $\frac{\text{ar}(\triangle ABC)}{\text{ar}(\triangle DBC)} = \frac{AO}{DO}$.



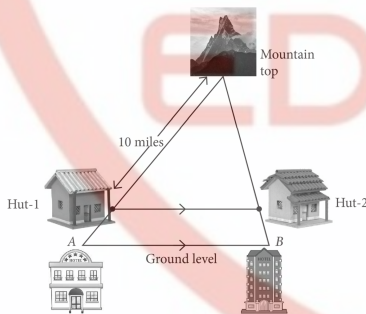
2. In a trapezium ABCD, it is given that $AB \parallel CD$ and $AB = 2CD$. Its diagonals AC and BD intersect at the point O such that $\text{ar}(\triangle AOB) = 84\text{cm}^2$. Find $\text{ar}(\triangle COD)$.

Section E

* Case study based questions

[4]

1. Two hotels are at the ground level on either side of a mountain. On moving a certain distance towards the top of the mountain two huts are situated as shown in the figure. The ratio between the distance from hotel B to hut -2 and that of hut -2 to mountain top is 3 : 7.



Based on the above information, answer the following questions.

- i. What is the ratio of the perimeters of the triangle formed by both hotels and mountain top to the triangle formed by both huts and mountain top?
- ii. What is the ratio of areas of two parts formed in the complete figure?
- iii. The distance between the hotel A and hut -1 is ?

Or

If the horizontal distance between the hut -1 and hut -2 is 8miles, then the distance between the two hotels is ?

|| ज्ञान एव श्रमस्य पुंजः ||