



MATHS

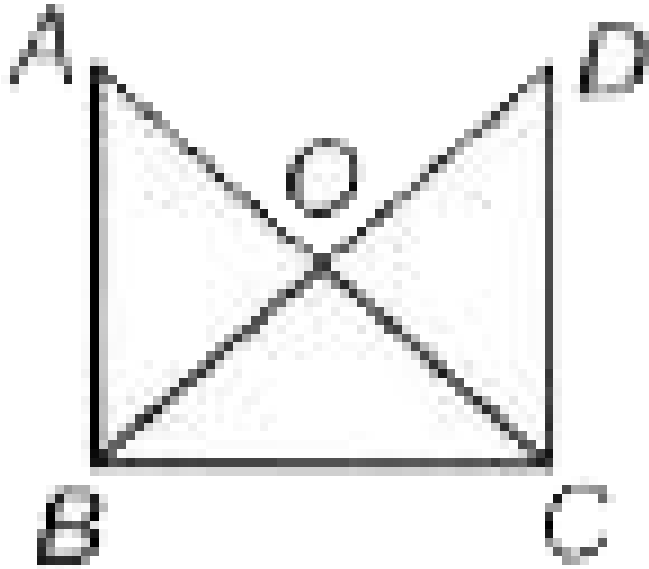
BOOKS - HT Olympiad Previous Year Paper

TRIANGLES

Mathematical Reasoning

1. In the given figure, $\triangle ABC \sim \triangle DCB$, then

$$AB \times DB =$$



A. $OA \times OD$

B. $OB \times OC$

C. $AB \times DC$

D. $DC \times AC$

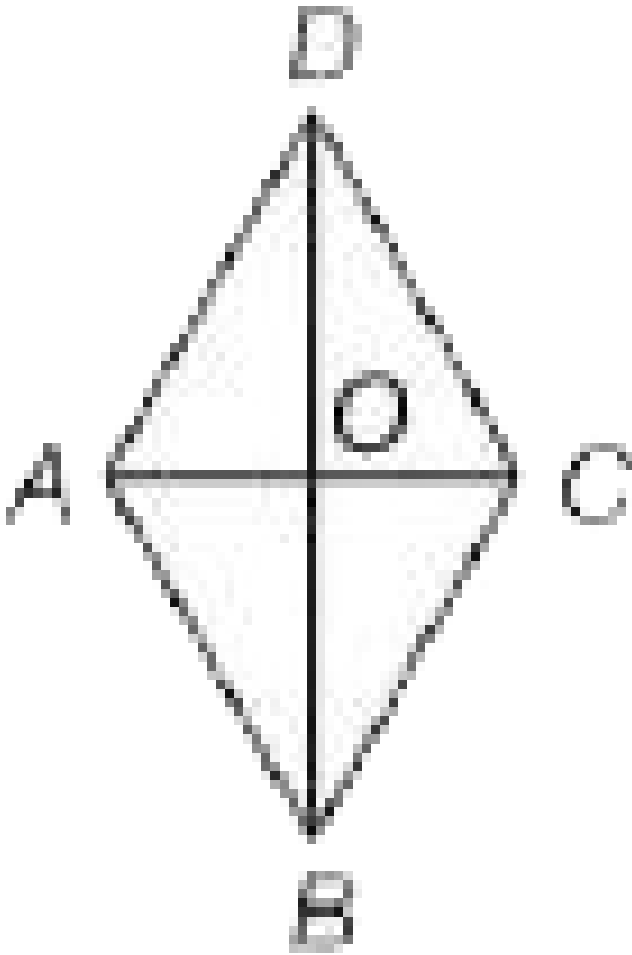
Answer: D



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2. In rhombus ABCD,

$$AB^2 + BC^2 + CD^2 + DA^2 =$$



A. $OA^2 + OB^2$

B. $OB^2 + OC^2$

c. $OC^2 + OD^2$

d. $AC^2 + BD^2$

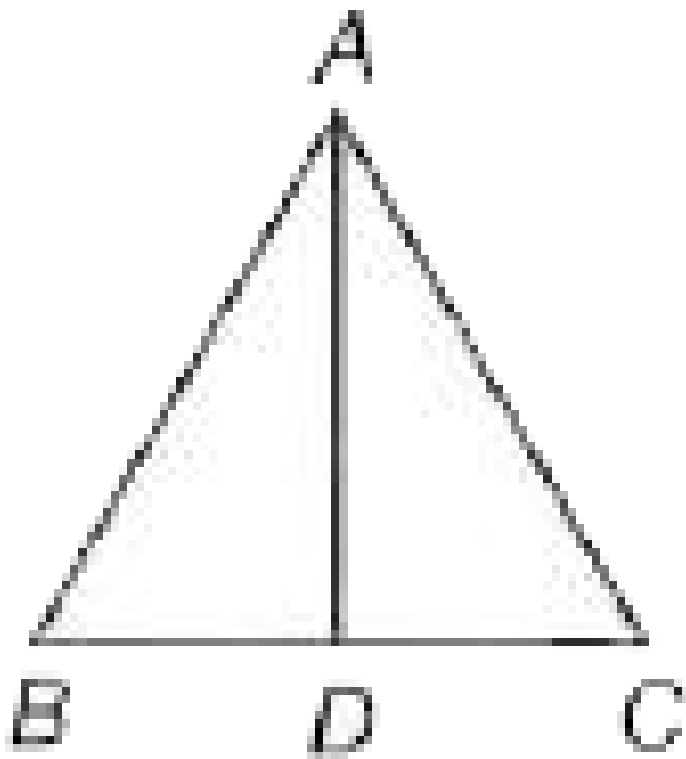
Answer: D



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3. In the given figure, $\angle BAC = \angle ADC$, then

$$\frac{CA}{CB} =$$



A. $CB \times CD$

B. CA^2

C. $\frac{DC}{AC}$

D. CD^2

Answer: C



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4. ABC is a triangle and D,E,F are the mid-points of the sides BC,CA, AB respectively . The ratio of the areas of $\triangle ABC$ and $\triangle DEF$ is :

A. 1 : 2

B. 4 : 5

C. 3 : 4

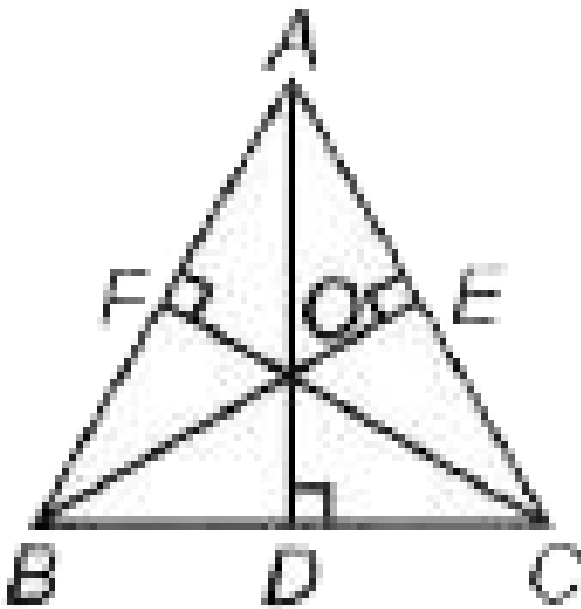
D. 1 : 4

Answer: D



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5. In the given figure, $AD \perp BC$, $BE \perp AC$, $CF \perp AB$, then $AF^2 + BD^2 + CE^2 =$



A. $OA^2 + OB^2 + OC^2$

B. $OD^2 + OE^2 + OF^2$

C. $AB^2 + BC^2 + AC^2$

D. $AE^2 + BF^2 + CD^2$

Answer: D



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6. ABC is a triangle right-angled at C. If p is the length of the perpendicular from C to AB and a, b, c are the sides, then which one of the following is correct ?

A. $1/p^2$

B. $2/p^2$

C. p^2

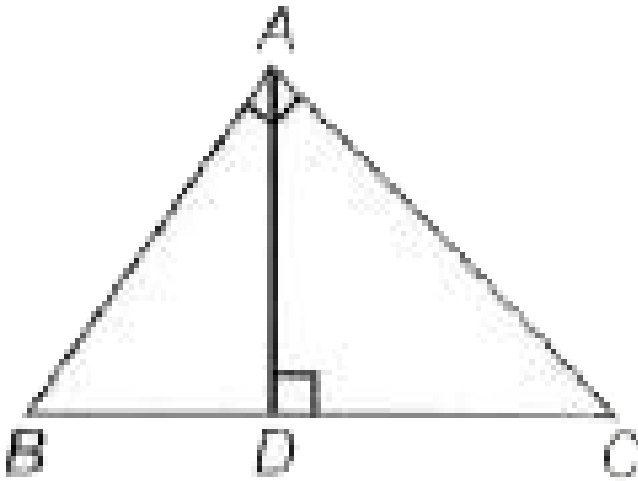
D. $2p^2$

Answer: A



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7. In the given $\triangle ABC$, $AD \perp BC$ and $\angle A$ is right angle. Then $AD^2 =$



A. $AB \times AC$

B. $BD \times CD$

C. $BC \times AC$

D. $AB \times BC$

Answer: B



8. $\triangle ABC$ is such that $AB = 3$ cm, $BC = 2$ cm, $CA = 2.5$ cm. If $\triangle ABC \sim \triangle DEF$ and $EF = 4$ cm, then perimeter of $\triangle DEF$ is :

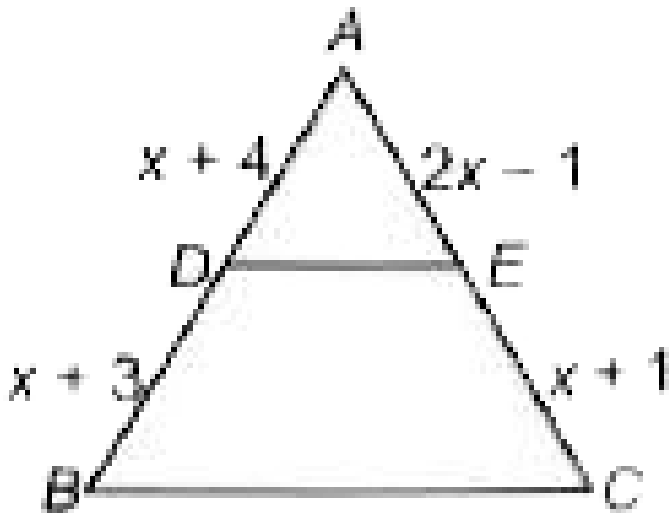
- A. 7.5 cm
- B. 15 cm
- C. 22.5 cm
- D. 30 cm

Answer: B



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9. In the given figure, $DE \parallel BC$. Find the value of x .



A. $\sqrt{5}$

B. $\sqrt{6}$

C. $\sqrt{3}$

D. $\sqrt{7}$

Answer: D



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10. $\Delta ABC \sim \Delta PQR$ and

$$ar(\Delta ABC) = 4ar(\Delta PQR) \text{ IF } BC = 12cm$$

then find QR

A. 9 cm

B. 10 cm

C. 6 cm

D. 8 cm

Answer: C



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Everyday Mathematics

1. If a tree casts a 18 feet shadow and at the same time, a child of height 3 feet casts a 2

feet shadow, then the height of the tree is

A. 27 feet

B. 32 feet

C. 45 feet

D. 36 feet

Answer: A



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2. Two poles of height 9m and 14m stand on a plane ground. If the distance between their feet is 12m, find the distance between their tops.

A. 13 m

B. 12 m

C. 14 m

D. 15 m

Answer: A



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3. A 12 cm rod is held between a flashlight and a wall as shown. Find the length of the shadow on the wall if the rod is 45 cm from the wall and 15 cm from the light shadow

75 cm 96 cm 48 cm 60 cm

A. 75 cm

B. 96 cm

C. 48 cm

D. 60 cm

Answer: C



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4. An aeroplane leaves an airport and flies due north at a speed of 1000 km per hour. At the same time, another aeroplane leaves the same airport and flies due west at a speed of 1200 km per hour. How far apart will be the two planes after $1\frac{1}{2}$

A. $300\sqrt{67}$ km

B. $400\sqrt{61}$ km

C. $200\sqrt{61}$ km

D. $300\sqrt{61}$ km

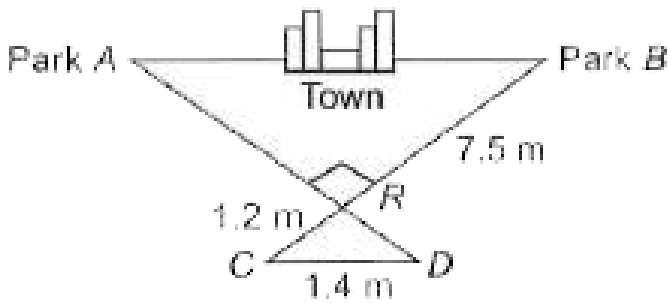
Answer: D



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5. A construction company wants to connect two parks on opposite sides of town with a road. Surveyors have laid out a map as shown. The road can be built through the town or

around town through point R. The roads intersect at a right angle at point R. The line joining Park A to Park B is parallel to the line joining C and D.



(i) What is the distance between the parks through town?

(ii) What is the distance from Park A to Park R?

A. (i) (ii)
 $9m$ $13m$

B. (i) (ii)
 $8m$ $12.5m$

C. (i) (ii)
 $8.75m$ $12m$

D. (i) (ii)
 $9m$ $14m$

Answer: C

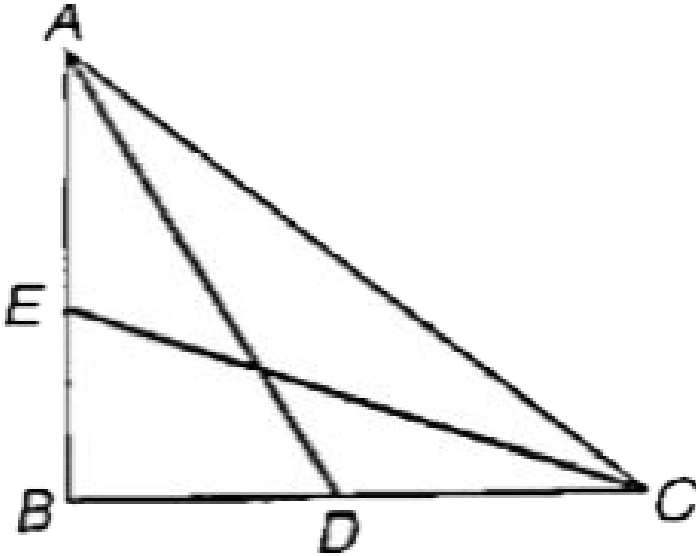


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Achievers Section Hots

1. In figure, ABC is a right triangle, right angled at B. AD and CE are the two medians drawn from A and C respectively. If $AC = 5$ cm and

$AD = \frac{3\sqrt{5}}{2} \text{ cm}$, find the length of CE:



A. 4 cm

B. $2\sqrt{5}$ cm

C. $3\sqrt{5}$ cm

D. 5 cm

Answer: B



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2. Match the following.

Column-I

(P) In $\triangle ABC$ and $\triangle PQR$

$$\frac{AB}{PQ} = \frac{AC}{PR}, \angle A = \angle P$$

$$\Rightarrow \triangle ABC \sim \triangle PQR$$

(Q) In $\triangle ABC$ and $\triangle PQR$

$$\angle A = \angle P, \angle B = \angle Q$$

$$\Rightarrow \triangle ABC \sim \triangle PQR$$

(R) In $\triangle ABC$ and $\triangle PQR$

$$\frac{AB}{PQ} = \frac{AC}{PR} = \frac{BC}{QR}$$

$$\Rightarrow \triangle ABC \sim \triangle PQR$$

(S) In $\triangle ABC$, $DE \parallel BC$

$$\Rightarrow \frac{AD}{BD} = \frac{AE}{EC}$$

Column-II

(1) AA similarity criterion

(2) SAS similarity criterion

(3) SSS similarity criterion

(4) BPT

A. $(P) \rightarrow (1), (Q) \rightarrow (2), (R) \rightarrow (3), (S) \rightarrow (4)$

B. $(P) \rightarrow (2), (Q) \rightarrow (1), (R) \rightarrow (3), (S) \rightarrow (4)$

C. $(P) \rightarrow (4), (Q) \rightarrow (2), (R) \rightarrow (1), (S) \rightarrow (3)$

D. $(P) \rightarrow (3), (Q) \rightarrow (1), (R) \rightarrow (4), (S) \rightarrow (2)$

Answer: B



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3. Which of the following statements is correct?

A. The ratio of the areas of two similar triangles is equal to the ratio of their corresponding sides.

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

C. All similar figures are congruent.

D. If in two triangles, two angles of one triangle is equal to the two corresponding angles of the other triangle, then two triangle may or may not be similar.

Answer: B



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4. P and Q are the mid-points of the sides CA and CB respectively of a ΔABC , right angled at C, then find :

(i) $4AC^2 + BC^2$

(ii) $4BC^2 + AC^2$

(iii) $4(AQ^2 + BP^2)$

A. (i) (ii) (iii)
 $4AQ^2$ $4BP^2$ $5AB^2$

B. (i) (ii) (iii)
 $5AQ^2$ $5BP^2$ $4AB^2$

C. (i) (ii) (iii)
 $4AQ^2$ $5BP^2$ $5AB^2$

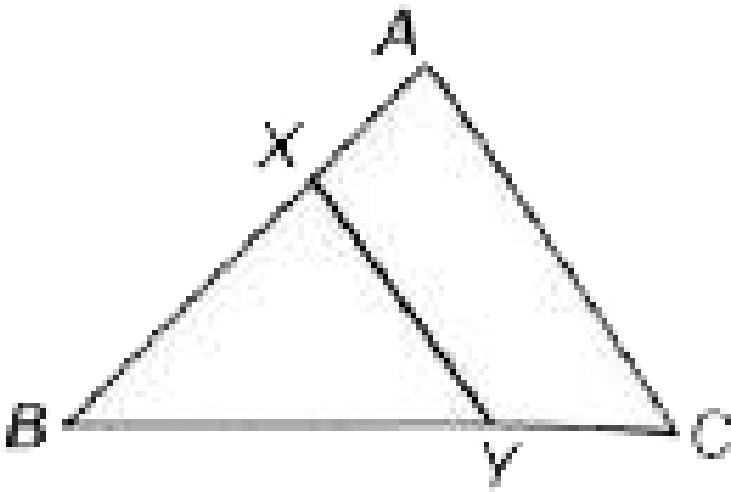
D. (i) (ii) (iii)
 $5AQ^2$ $4BP^2$ $4AB^2$

Answer: A



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5. In the given figure, the line segment XY is parallel to side AC of $\triangle ABC$ and it divides the triangle into two parts of equal area. Then, find



(i) $AX : AB$ (ii) $\frac{AC}{XY}$.

- | | | |
|----|----------------------|----------------|
| | (i) | (ii) |
| A. | $(2 + \sqrt{2}) : 2$ | $\sqrt{2} - 2$ |
| | (i) | (ii) |
| B. | $(2 - \sqrt{2}) : 2$ | $\sqrt{2} - 1$ |
| | (i) | (ii) |
| C. | $(2 - \sqrt{3}) : 3$ | 3 |
| | (i) | (ii) |
| D. | $(2 + \sqrt{2}) : 3$ | $\sqrt{2} - 3$ |

Answer: B



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