



MATHS

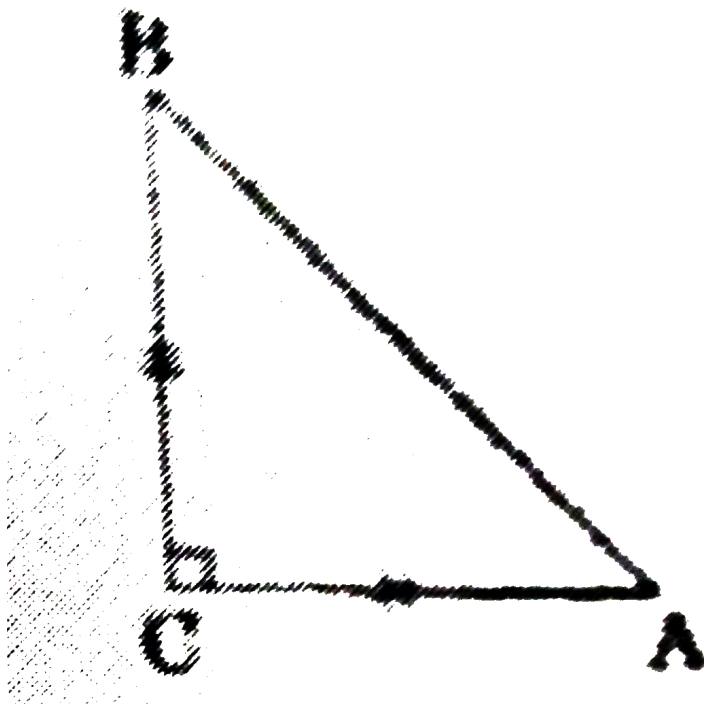
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TRIANGLES

Objective Type Questions Multiple Choice Questions

1. In figure ABC is an isosceles triangle , right angled at C .

Therefore



A. $AB^2 = 2AC^2$

B. $BC^2 = 2AB^2$

C. $AC^2 = 2AB^2$

D. $AB^2 = 4AC^2$

Answer: A



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2. In a right-angled triangle ABC, right angled at B, $AB = \frac{x}{2}$,

$BC = x + 2$ and $AC = x + 3$. The value of x is :

A. 5

B. 10

C. 12

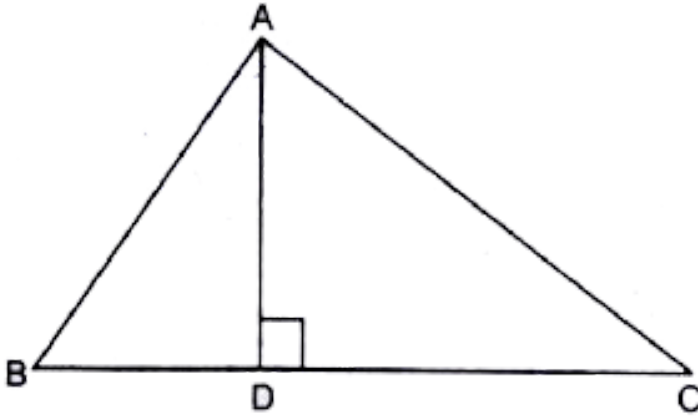
D. 14

Answer: B



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3. In the figure, if $\angle BAC = 90^\circ$ and $AD \perp BC$, then:



A. $BD \cdot CD = BC^2$

B. $AB \cdot AC = BC^2$

C. $BD \cdot CD = AD^2$

D. $AB \cdot AC = AD^2$

Answer: C



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4. The lengths of the diagonals of a rhombus are 16 cm and 12 cm. Then, the length of the side of the rhombus is

- A. 9 cm
- B. 10 cm
- C. 8 cm
- D. 20 cm

Answer: B

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5. If D, E and F are the mid-points of sides BC, CA and AB respectively of $\triangle ABC$, then the ratio of the areas of $\triangle DEF$ to the area of $\triangle ABC$ is :

A. 1:4

B. 1:2

C. 1:3

D. 2:3

Answer: A



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6. If $\triangle ABC \sim \triangle EDF$ and $\triangle ABC$ is not similar to $\triangle DEF$ then which of the following is not true ?

A. $BC \cdot EF = AC \cdot FD$

B. $AB \cdot EF = AC \cdot DE$

C. $BC \cdot DE = AB \cdot EF$

$$D. BC.DE = AB.FD$$

Answer: C



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7. If in two $\triangle ABC$ and $\triangle PQR$, $\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}$, then

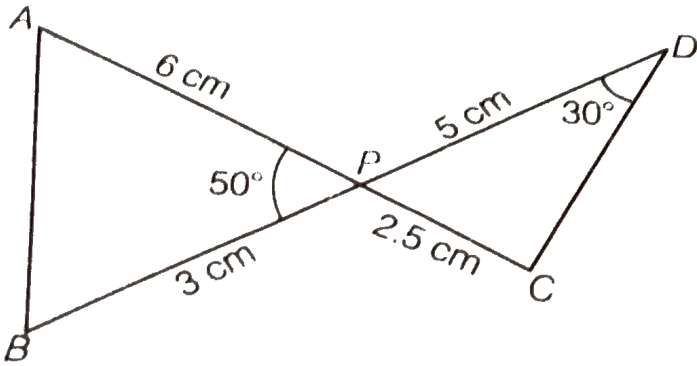
- A. $\triangle PQE \sim \triangle CAB$
- B. $\triangle PQR \sim \triangle ABC$
- C. $\triangle CBA \sim \triangle CBA \sim \triangle PQR$
- D. $\triangle BCA \sim \triangle PQR$

Answer: A



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8. In figure, two line segments AC and BD intersect each other at the point P such that $PA = 6$ cm, $PB = 3$ cm, $PC = 2.5$ cm, $PD = 5$ cm, $\angle APB = 50^\circ$ and $\angle CDP = 30^\circ$. Then, $\angle PBA$ is equal to



- A. 50°
- B. 30°
- C. 60°
- D. 100°

Answer: D



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9. In $\triangle ABC$ and $\triangle DEF$, it is given that $\angle B = \angle E$, $\angle F = \angle C$ and $AB = -3DE$, then the two triangles are

- A. congruent but not similar
- B. similar but not congruent
- C. neither congruent nor similar
- D. congruent as well as similar

Answer: B



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10. In $\triangle DEF$ and $\triangle PQR$, it is given that $\angle D = \angle Q$ and $\angle R = \angle E$, then which of the following is not true?

A. $\frac{EF}{PR} = \frac{DE}{PQ}$

B. $\frac{DE}{PQ} = \frac{EF}{RP}$

C. $\frac{DE}{QR} = \frac{DF}{PQ}$

D. $\frac{EF}{RP} = \frac{DE}{QR}$

Answer: B



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11. If $\triangle ABC \sim \triangle PQR$ with $\frac{BC}{QR} = \frac{1}{3}$, then $\frac{ar(\triangle PRQ)}{ar(\triangle BCA)}$ is equal to

A. 9

B. 3

C. $\frac{1}{3}$

D. $\frac{1}{9}$

Answer: A



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12. In $\triangle ABC$ and $\triangle DEF$, it is given that $\frac{AB}{DE} = \frac{BC}{FD}$ then

A. $\angle B = \angle E$

B. $\angle A = \angle D$

C. $\angle B = \angle D$

D. $\angle A = \angle F$

Answer: C



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13. If $\Delta ABC \sim \Delta QRP$, $\frac{ar(\Delta ABC)}{ar(\Delta PQR)} = \frac{9}{4}$, $AB=18$ cm and $BC=$

15 cm, then PR is equal to

A. 10 cm

B. 12 cm

C. $\frac{20}{3}$ cm

D. 8 cm

Answer: A



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14. If S is a point on side PQ of a $\triangle PQR$ such that $PS=QS=RS$, then

A. $PRQR = RS^2$

B. $QS^2 + RS^2 = QR^2$

C. $PR^2 + QR^2 = PQ^2$

D. $PS^2 + RS^2 = PR^2$

Answer: C



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Objective Type Questions Fill In The Blanks

1. Let $ABC \sim \triangle DEF$ and their areas be 81cm^2 and 144cm^2 .

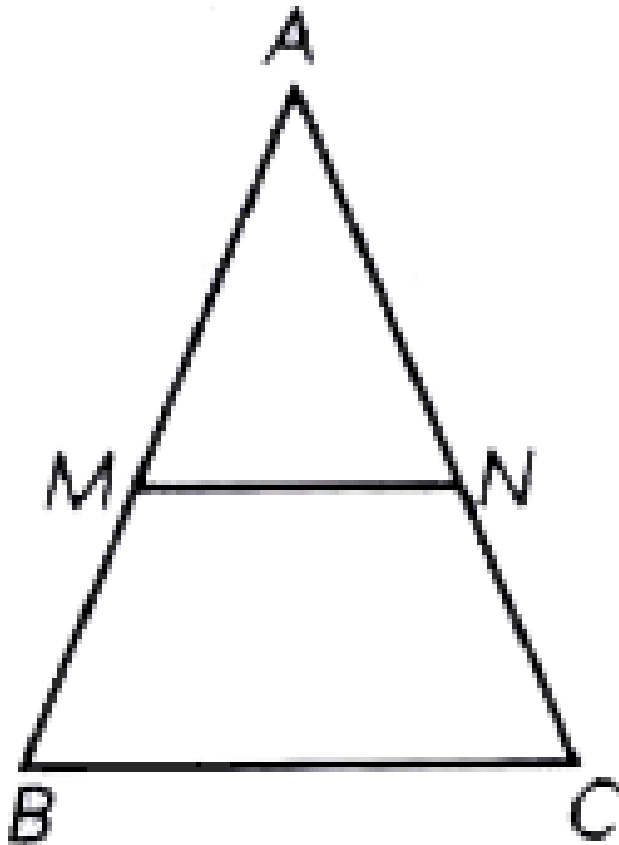
If $EF = 24$ cm, then length of side BC is Cm



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2. In the figure,

$MN \parallel BC$ and $AM:MB = 1:3$, then $\frac{\text{ar}(\triangle AMN)}{\text{ar}(\triangle ABC)} =$



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3. In $\triangle ABC$, $AB = 6\sqrt{3}cm$, $AC = 12cm$ and $BC = 6cm$.

Then $\angle B$ is

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4. Two triangles are similar if their corresponding sides are

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5. A ladder 10m long reaches a window 8 m above the ground. Find the distance of the foot of the ladder from base of the wall.

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6. In an equilateral triangle of side $2a$, calculate the length of its altitude.



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7. The perimeters of two similar triangles $\triangle ABC$ and $\triangle PQR$ are 35cm and 45 cm respectively, then the ratio of the areas of the two triangles is _____.



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8. The length of an altitude in an equilateral triangle of side 'o' cm is



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9. If areas of two similar triangles are equal, then these triangles are.....



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10. A diagonal of a parallelogram divides it into two triangles of equal area.



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11. If S is a point on side PQ of a $\triangle PQR$ such that $PS = QS = RS$, then $PR^2 + QR^2 = \dots\dots\dots$



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Very Short Questions

1. ABC and BDE are two equilateral triangles such that D is the mid-point of BC . The ratio of the areas of the triangles ABC and BDE is 2:1 (b) 1:2 (c) 4:1 (d) 1:4

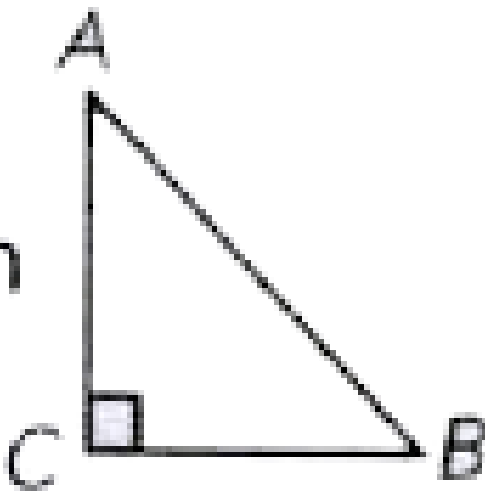
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2. It is given that $\triangle DEF \sim \triangle RPQ$. Is it true to say that $\angle D = \angle R$ and $\angle F = \angle P$? Why?

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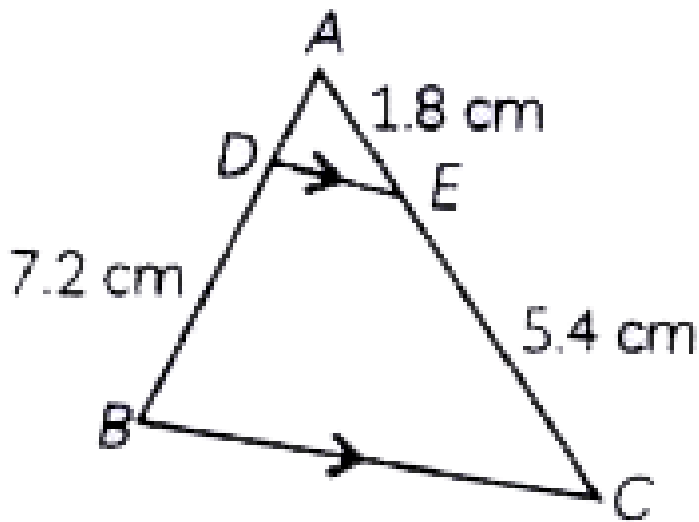
3. In the given figure, $\triangle ABC$ is an isosceles triangle right angled at C with $AC = 4$ cm. Find the length of AB .

4 cm



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4. In the given figure, $DE \parallel BC$. Find the length of side AD given that $AE = 1.8\text{cm}$, $BD = 7.2\text{cm}$ and $CE = 5.4\text{cm}$.

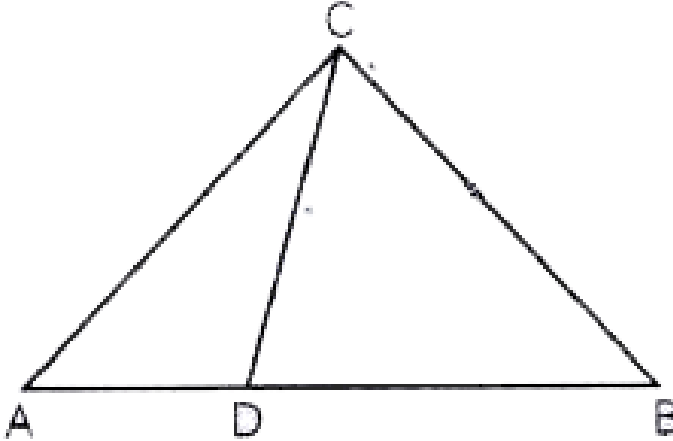


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5. Is the following statement true? Why? "Two quadrilaterals are similar, if their corresponding angles are equal".

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6. In the figure, if $\angle ACB = \angle CDA$, $AC = 6\text{cm}$ and $AD = 3\text{cm}$, then find the length of AB



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7. The ratio of the corresponding altitudes of two similar triangles is $\frac{3}{5}$. Is it correct to say that ratio of their areas is $\frac{6}{5}$? Why?

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8. In a rhombus ABCD, prove that $AC^2 + BD^2 = 4AB^2$



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9. The area of two similar triangles are 25 sq cm and 121 sq cm.

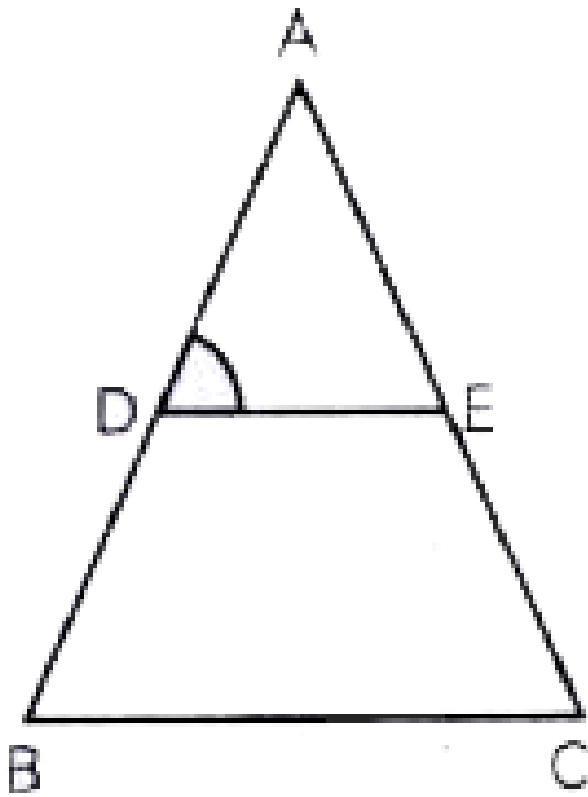
Find the ratio of their corresponding sides



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10. In the given figure, if $\angle D = \angle C$, then it is true that

$\triangle ADE \sim \triangle ACB$? Why?



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Short Answer Sa I Type Questions

1. A and B are respectively the points on the sides PQ and PR of a $\triangle PQR$ such that $PQ = 12.5$ cm, $PA = 5$ cm, $BR = 6$ cm and $PB = 4$ cm. Is $AB \parallel QR$? Give reason for your answer.

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2. If $\triangle ABC \sim \triangle DEF$ and their areas be, respectively, 64cm^2 and 121cm^2 . If $EF = 15.4\text{cm}$. find BC .

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3. In the adjoining figure, DE is parallel to BC and $AD = 1\text{cm}$, $BD = 2\text{cm}$. What is the ratio of the area of ABC to the area of ADE ?

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4. Is the triangle with sides 25 cm, 5 cm and 24 cm a right triangle? Give reason for your answer.

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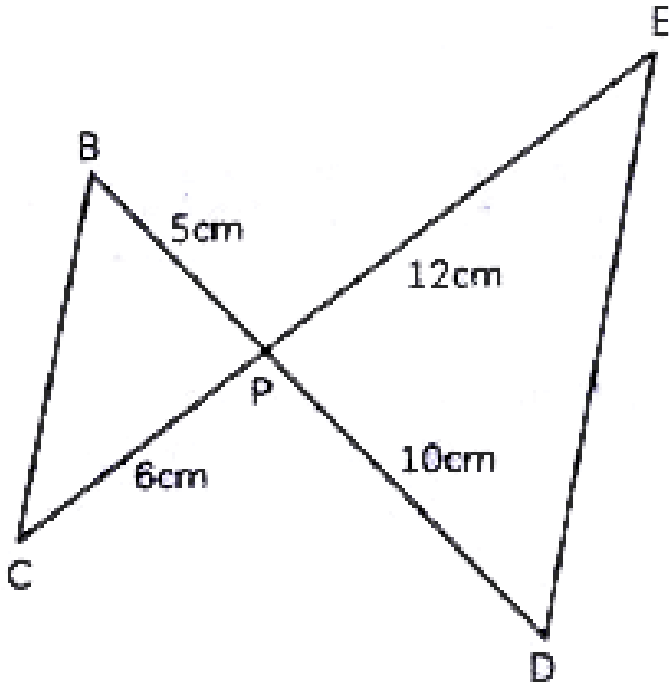
5. The perimeters of two similar triangles are 30cm and 20cm respectively. If one side of the first triangle is 12cm, determine the corresponding side of the second triangle.

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6. PQR is a triangle right angled at P and M is a point on QR such that $PM \perp QR$. Show that $PM^2 = QM \cdot MR$.

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7. In figure, BD and CE intersect each other at point P. Is $\triangle PBC \sim \triangle PDE$? Why?



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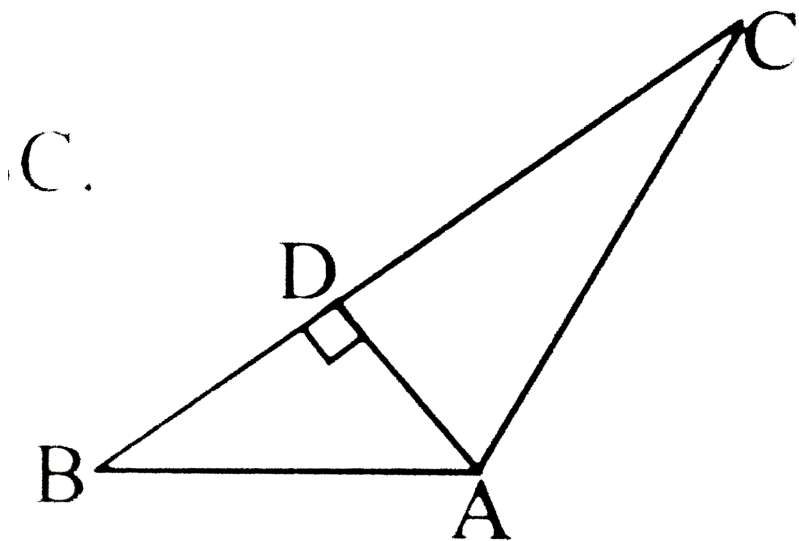
8. In $\triangle PQR$ and $\triangle MST$,
 $\angle P = 55^\circ$, $\angle Q = 25^\circ$, $\angle M = 100^\circ$ and $\angle S = 25^\circ$. Is
 $\triangle PQR \sim \triangle TSM$? Why?

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9. In figure ABC and DBC are two triangles on the same base BC. If AD intersects BC at O, show that $\frac{\text{ar}(ABC)}{\text{ar}(DBC)} = \frac{AO}{DO}$.

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10. See the given figure. In $\triangle ABC$, seg $AD \perp$ seg BC .
Prove that: $AB^2 + CD^2 = BD^2 + AC^2$



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11. Two sides and the perimeter of one triangle are respectively three times the corresponding sides and the perimeter of the other triangle. Are the two triangles similar? Why?

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12. If in two right triangles, one of the acute angles of one triangle is equal to an acute angle of the other triangle. Can you say that two triangles will be similar? Why?

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13. D is a point on side QR of $\triangle PQR$ such that $PD \perp QR$. Will it be correct to say that $\triangle PQD \sim \triangle RPD$? Why?

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14. In Figure $DEAC$ and $DCap$. Prove that $\frac{BE}{EC} = \frac{BC}{CP}$

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15. Is it true to say that, if in two triangles, an angle of one triangle is equal to an angle of another triangle and two sides of one triangle are proportional to the two sides of the other triangle, then the triangles are similar? Give reason for your answer.

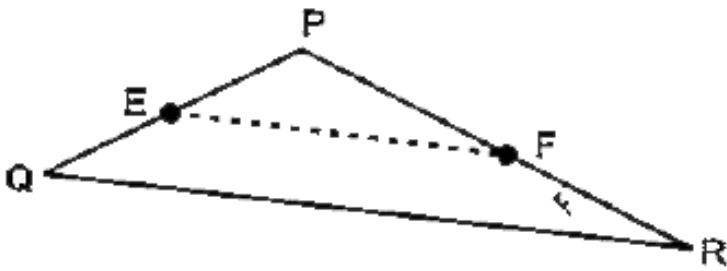
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16. In an equilateral triangle, prove that three times the square of one side is equal to four times the square of one of its altitudes.

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17. $PE = 4m$, $QE = 4.5m$, $PF = 8m$ and $RF = 9m$.

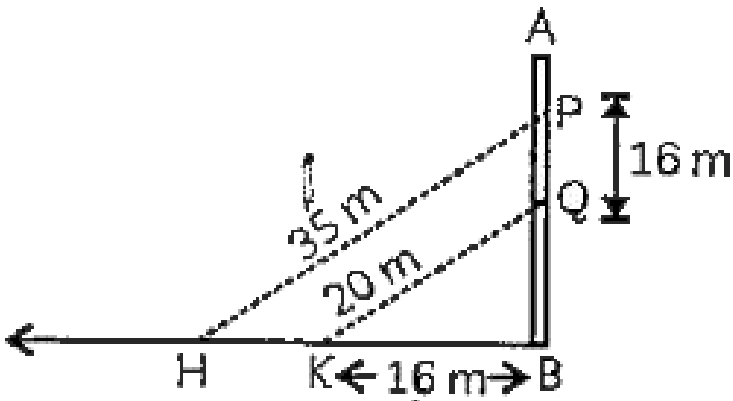
Is $EF \parallel QR$? Justify your answer.



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18. Given that $PQ = 16$ m, $KB = 16$ m,

$PH = 35$ m and $QK = 20$ m, Find:

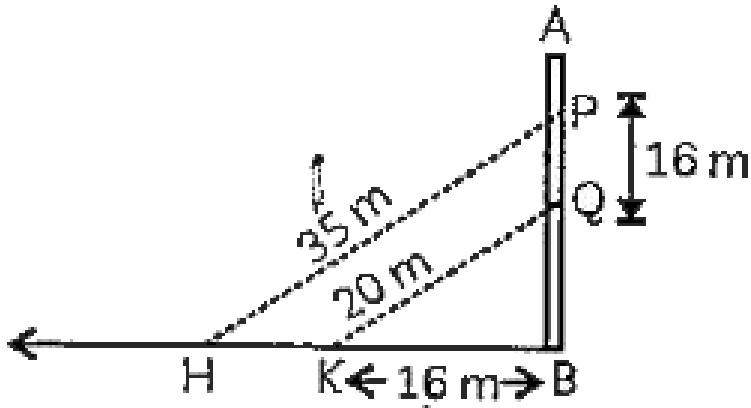


Find BQ .

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19. Given that $PQ = 16\text{ m}$, $KB = 16\text{ m}$,

$PH = 35\text{ m}$ and $QK = 20\text{ m}$, Find HK



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20. $\triangle ABC \sim \triangle DEF$ such that

$DE = 3\text{ cm}$, $EF = 2\text{ cm}$, $DF = 2.5\text{ cm}$ and $BC = 4\text{ cm}$.

Find perimeter of $\triangle ABC$.

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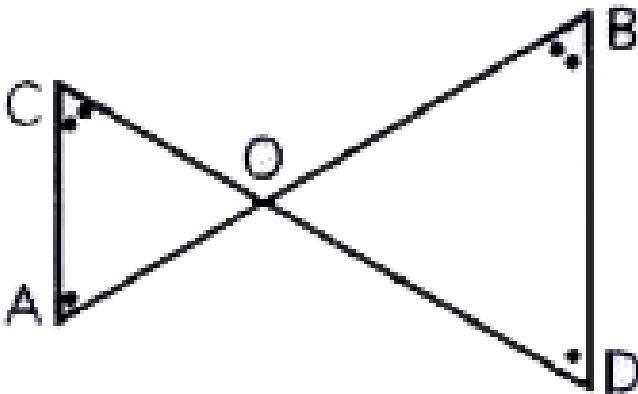
21. P and Q are the points on the sides DE and DF of a triangle DEF such that $DP = 5$ cm, $DE = 15$ cm, $DQ = 6$ cm and $QF = 18$ cm.

Is $PQ \parallel EF$? Give reasons for your answer

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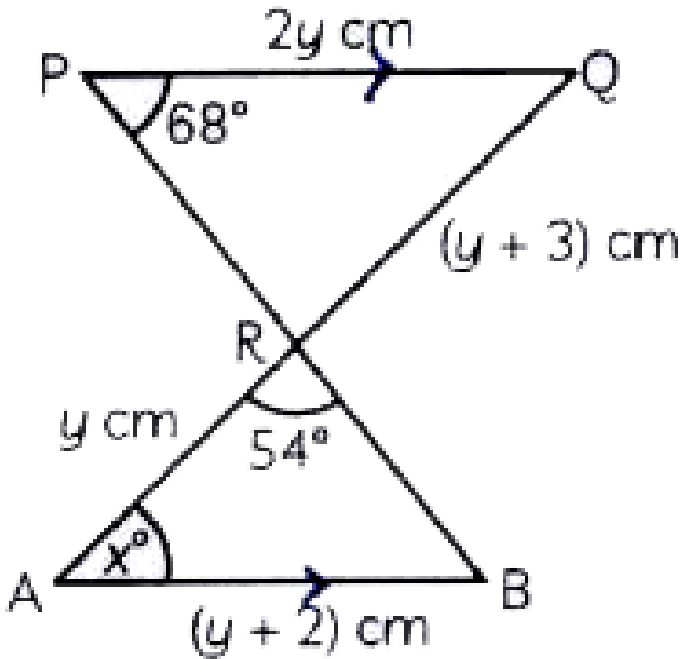
22. In the given figure, $OC \cdot OD = OA \cdot OB$

Show that : $\angle A = \angle D$ and $\angle C = \angle B$.



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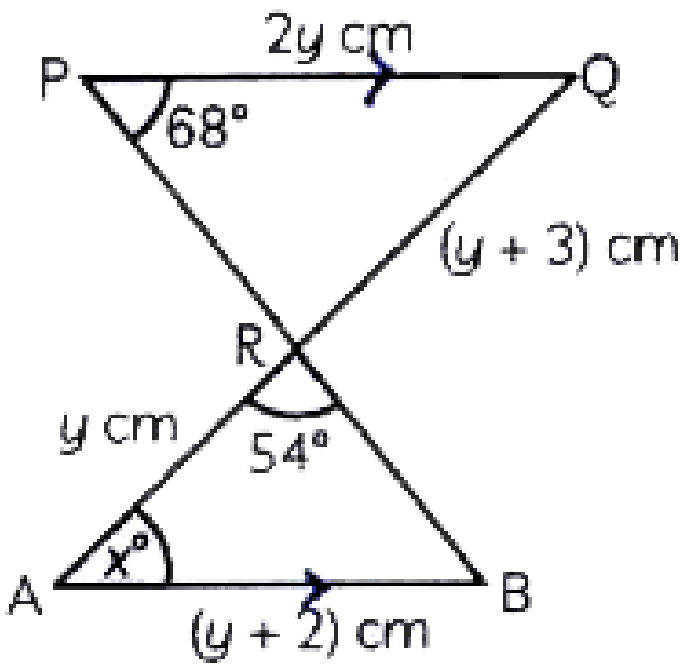
23. Given that $\triangle PQR$ is similar to $\triangle BAR$, find the value of x :



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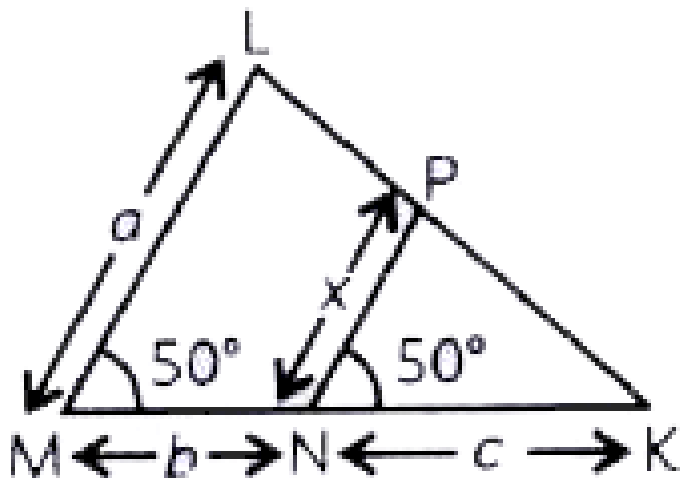
24. $\triangle PQR$ is similar to $\triangle BAR$, find:

the value of y :



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25. In the given figure, find the value of x in terms of a , b and c .



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26. R and S are points on the sides DE and EF respectively of a

$\triangle DEF$ such that $ER = 5$ cm,
 $RD = 2.5$ cm, $SE = 1.5$ cm and $FS = 3.5$ cm. Find

Whether $RS \parallel DF$ or not.

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27. Prove that the sum of the squares of the sides of a rhombus is equal to the sum of the squares of its diagonals.

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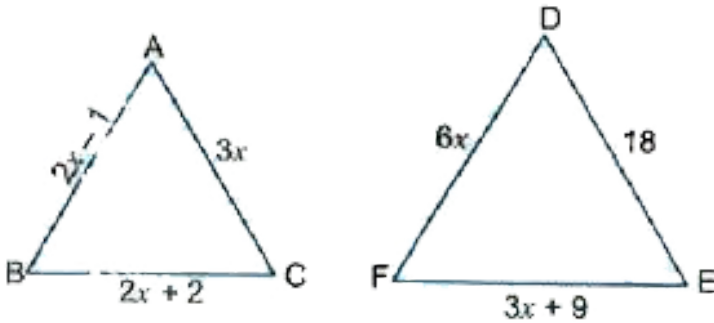
28. The areas of two similar triangles are 36 cm^2 and 100 cm^2 . If the length of a side of the smaller triangle is 3 cm, find the length of the corresponding side of the larger triangle.

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29. If $\triangle ABC \sim \triangle DEF$, $AB=4\text{cm}$, $DE=6$, $EF=9 \text{ cm}$ and $FD=12 \text{ cm}$, then find the perimeter of $\triangle ABC$.

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30. In Fig. 7.27, if $\triangle ABC \sim \triangle DEF$ and their sides are of lengths (in cm) as marked along them, then find the lengths of the sides of each triangle.

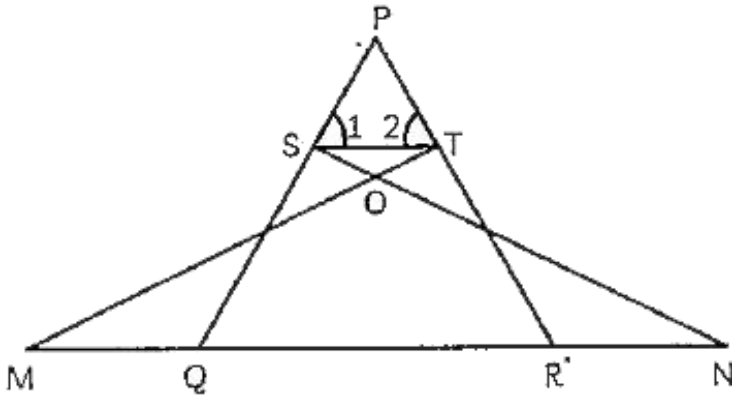


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Short Answer Sa li Type Questions

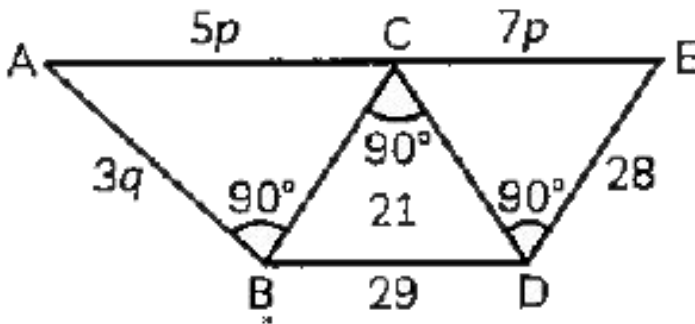
1. In the given figure, figure, if $\angle 1 = \angle 2$ and $\triangle NSQ \cong \triangle MTR$, then prove that

$\triangle PTS \sim \triangle PRQ$.



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2. Three $30^\circ - 60^\circ - 90^\circ$ set squares are set together as shown in the diagram.

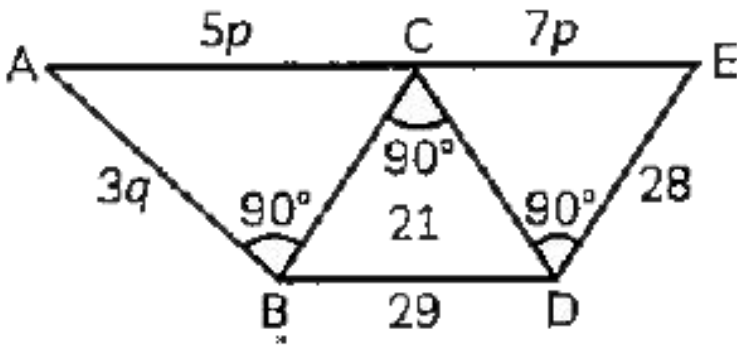


Find the value of P



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3. Three $30^\circ - 60^\circ - 90^\circ$ set squares are set together as shown in the diagram.



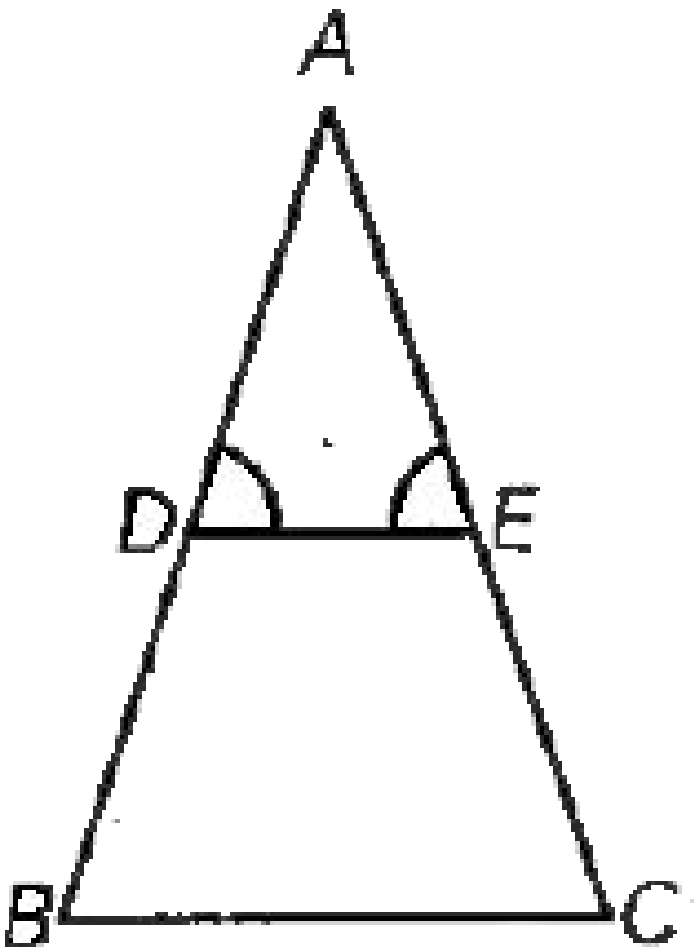
Find the value of length AB



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4. In the figure, $\angle D = \angle E$ and $\frac{AD}{DB} = \frac{AE}{EC}$, prove that

$\triangle BAC$ is an isosceles triangle.



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5. In a triangle ABC , $B = 90^\circ$ and D is the mid-point of BC then prove that $AC^2 = AD^2 + 3CD^2$



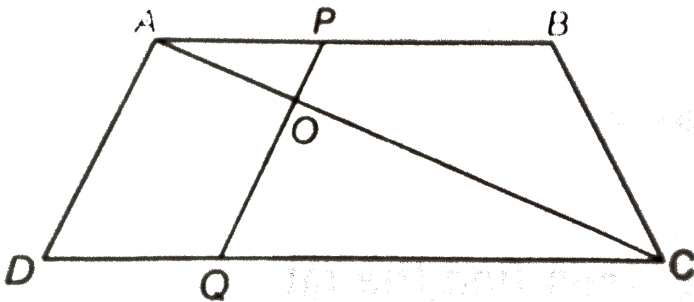
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6. Diagonals of a trapezium PQRS intersect each other at the point O, $PQ \parallel RS$ and $PQ = 3RS$. Find the ratio of the areas of $\triangle POQ$ and $\triangle ROS$.



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7. In figure, if $AB \parallel DC$ and AC, PQ intersect each other at the point O. Prove that $OA \cdot CQ = OC \cdot AP$.



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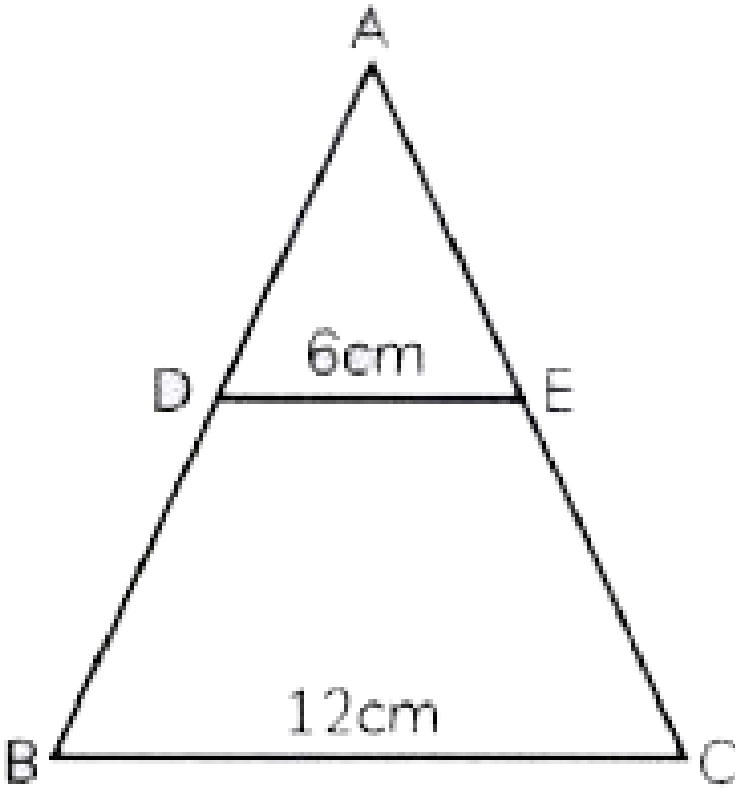
8. BL and CM are medians of a triangle ABC right angled at A.

Prove that $4(BL^2 + CM^2) = 5BC^2$



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9. In the given figure, if $DE \parallel BC$, then find the ratio of area of ($\triangle ADE$) and ($\square DECB$).



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10. $ABCD$ is a trapezium in which $AB \parallel DC$ and P, Q are points on AD and BC respectively, such that $PQ \parallel DC$, if $PD = 18\text{ cm}$, $BQ = 35\text{ cm}$ and $QC = 15\text{ cm}$. Find AD .



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11. Two triangles BAC and BDC , right angled at A and D respectively, are drawn on the same base BC and on the same side of BC . If AC and DB intersect at P , prove that $AP \times PC = DP \times PB$.



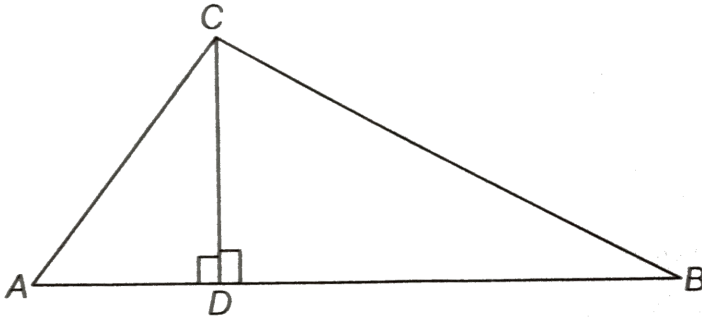
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12. Diagonals of a trapezium PQRS intersect each other at the point O, $PQ \parallel RS$ and $PQ = 3RS$. Find the ratio of the areas of ΔPOQ and ΔROS .



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13. In given figure, if $\angle ACB = \angle CDA$, $AC = 8\text{cm}$ and $AD = 3\text{cm}$, then find BD .



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14. A 15 high tower casts a shadow 24 long at a certain time at the same time, a telephone pole casts a shadow 16 long. Find the height of the telephone pole.

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15. P and Q are points on the sides CA and CB respectively of ABC , right angled at C . Prove that $AQ^2 + BP^2 = AB^2 + PQ^2$.

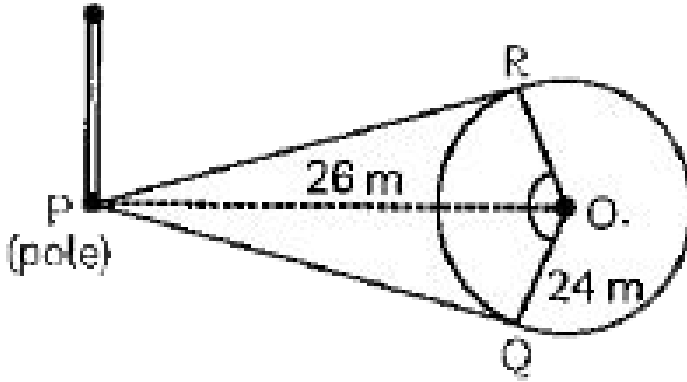


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16. If the areas of two similar triangles are equal, prove that they are congruent.



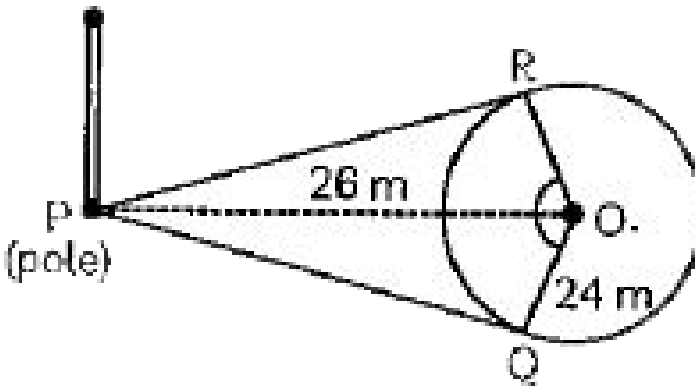
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17.

Find the length of PQ and PR,

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18.

If six trees are to be planted along each tangential line

segments at equal distances, find the distance between any two consecutive trees.



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19. In $\triangle ABC$, D , E , F are respectively the mid points of the sides AB , BC and AC . Find ratio of the area of $\triangle DEF$ and area of $\triangle ABC$.



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20. Prove that the area of an equilateral triangle described on one side of a square is equal to half the area of the equilateral triangle described on one of its diagonals.



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21. A flag pole 18 m high casts a shadow 9.6 m long. Find the distance of the top of the pole from the far end of the shadow.



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Long Answer Type Questions

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



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2. In the given figures, if PQRS is a parallelogram and $AB \parallel PS$, then prove that $OC \parallel SR$.

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3. If $\angle B$ of ΔABC is an acute angle and $AD \perp BC$; prove that $AC^2 = AB^2 + BC^2 - 2 BC \cdot CD$

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4. Prove that in a right angle triangle, the square of the hypotenuse is equal to the sum of the squares of other two sides.

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5. For going to a city B from city A there is a route via city C such that $AC \perp CB$, $AC = 2x$ km and $CB = 2(x + 7)$ km. It is proposed to construct a 26 km highway which directly connects the two cities A and B. Find how much distance will be saved in reaching city B from city A after the construction of the highway.



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6. ii ΔPQR , $PD \perp QR$ such that D lies on QR, if $PQ=a, PR=b, QD=c$ and $DR=d$, then prove that $(a+b)(a-b)=(c+d)(c-d)$.

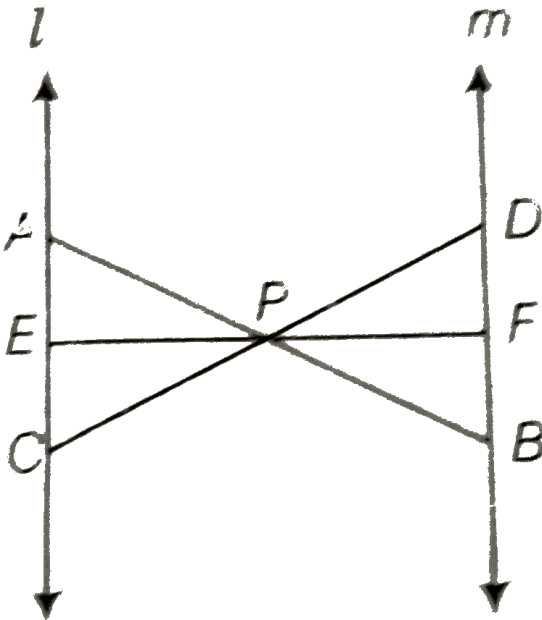


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7. In an equilateral triangle ABC, D is a point on side BC such that $BD = \frac{1}{3}BC$. Prove that $9AD^2 = 7AB^2$.

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8. In given figure, $l \parallel m$ and line segments AB, CD and EF are concurrent at point P. Prove that $\frac{AE}{BF} = \frac{AC}{BD} = \frac{CE}{FD}$





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9. 14 In Fig. 6.21, PA, QB, RC and SD are all perpendiculars to a line l , AB 6 cm, BC 9 cm, CD 8 cm and SP 36 cm. Find PO, QR and RS. Fig. 6.21



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10. Prove that the area of the semicircle drawn on the hypotenuse of a right angled triangle is equal to the sum of the areas of the semicircles drawn on the other two sides of the triangle



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