MATHS

BOOKS - NAVBODH MATHS (HINGLISH)

PYTHAGORAS THEOREM

3 1 1 Mark Each

1. Out of the following which is a Pythagoream triplet?

A. $(5, 12, 14)$

B. $(3, 4, 2)$

C. $(8, 15, 17)$

D. $(5, 5, 2)$

Answer:

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2. In a right angled triangle,if the sum of the squares of the sides making a right angle is 169, then what is the length of the hypotenuse?

A. 15

B. 13

C. 5

D. 12

Answer:

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3. If a, b, c are sides of a triangle and $a^2 + b^2 = c^2$, then name the type of the triangle.

A. Obtuse angled triangle

B. Acute angled triangle

C. Right angled triangle

D. Equilateral triangle

Answer:

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4. Find the perimeter of a square, if its diagonal is $10\sqrt{2}cm$.

A. $10cm$

B. $40\sqrt{2}cm$

C. $20cm$

D. $40cm$

Answer:

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5. In ΔPQR, seg PM is median. $PM = 9$, $PQ^2 + PR^2 = 290$ then find length of seg QR.

A. 6

B. 10

C. 16

D. 8

Answer:

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6. The height and base of a right angled triangle are $24cm$ and $18cm$, find the length of its hypotenuse.

A. $24cm$

B. $30cm$

C. $15cm$

D. $18cm$

Answer:

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7. In $\Delta ABC, \quad AB = 6\sqrt{3}cm, \quad AC = 12cm,$ $BC = 6cm$.Find the measure of $\angle A$.

A. 30°

B. 60°

C. 90°

D. 45°

Answer:

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8. In ΔABC, $\angle B = 90^\circ$. D is the midpoint of hypotenuse AC. If $BD = 4.5cm$, then find the length of hypotenuse AC.

A. $9cm$

B. $4.5cm$

C. $5cm$

D. $9.5cm$

Answer:

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3 2 1 Mark Each

1. Observe the triplet $(4, 5, 8)$. State whether it is a Pythagorean triplet or not.

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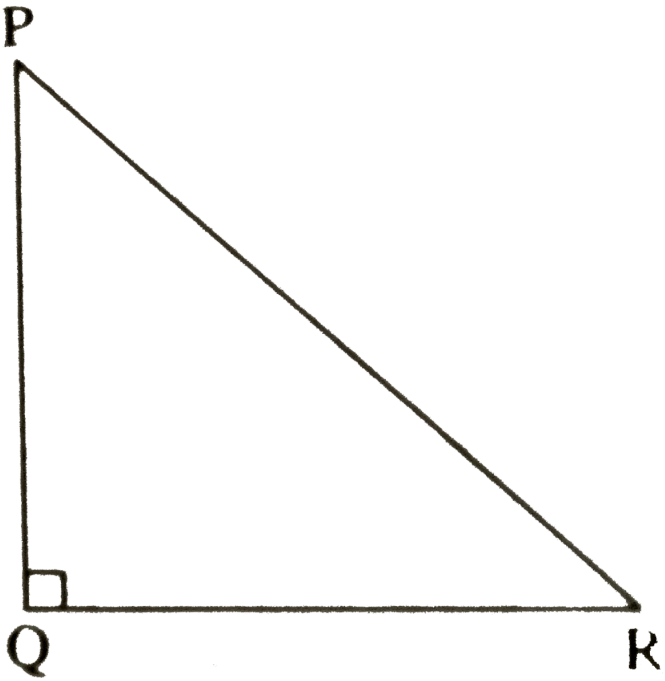
2. In $\Delta PQR, \angle PQR = 90^\circ$. State the Pythagorean relation in the triangle.



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3. In ΔABC, if $AB^2 = AC^2 + CB^2$. State with reason whether ΔABC is a right angled triangle or not.

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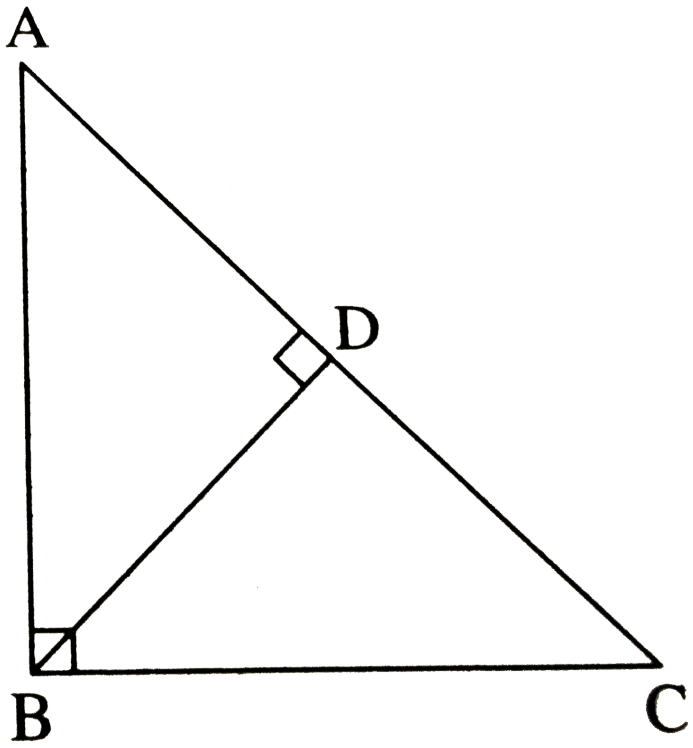
4. In the figure, $\angle ABC = 90^\circ$ and seg $Bd \perp$ side AC, $A - D - C$ then by property of geometric mean. $BD^2 = \square \times \square$. Fill in the boxes with the

correct answer.



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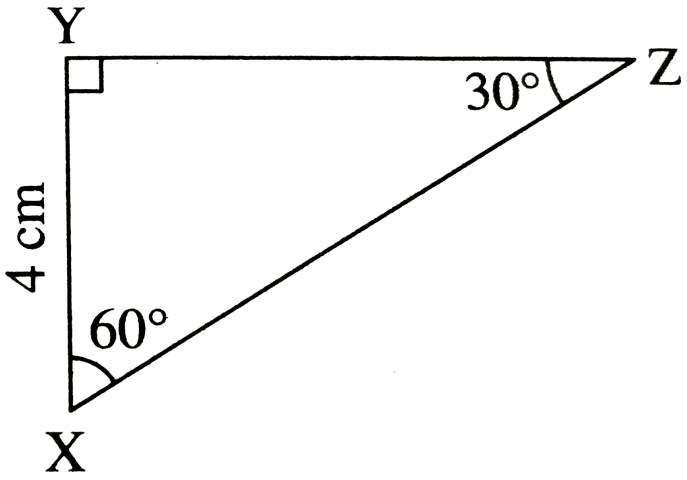
5. In ΔXYZ, $\angle XYZ = 90^\circ$, $\angle YZX = 30^\circ$, $\angle YXZ = 60^\circ$, $XY = 4cm$ then write the value of

XZ.



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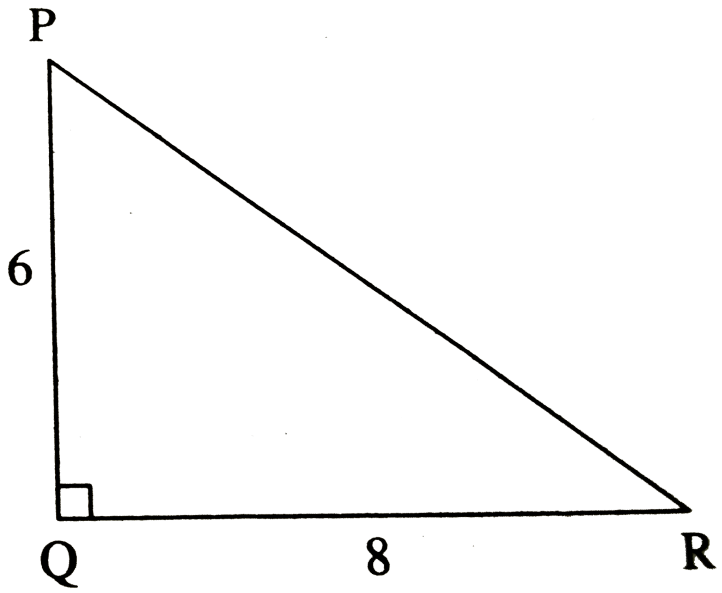
6. In ΔPQR, $\angle PQR = 90^\circ$, $PQ = 6$ and $QR = 8$ then the length of seg PR is..... .



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3 3 2 Mark Each

1. Is $(3, 5, 4)$ a Pythagoren triplet ? Give reason.

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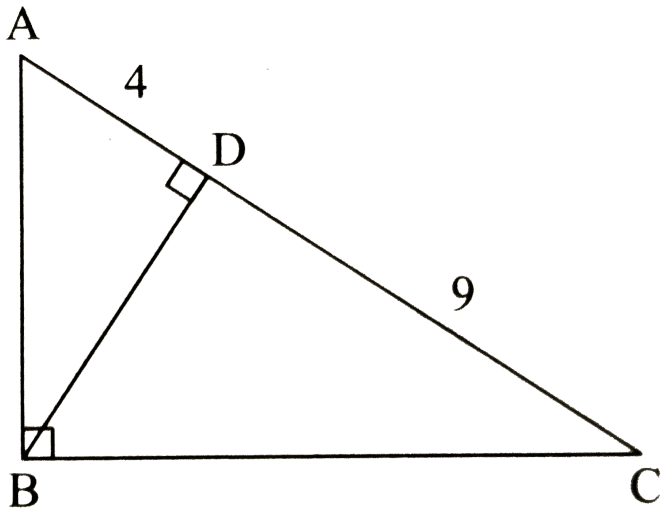
2. In right angled ΔABC, $BD \perp AC$. If $AD = 4$, $DC = 9$, then find BD.



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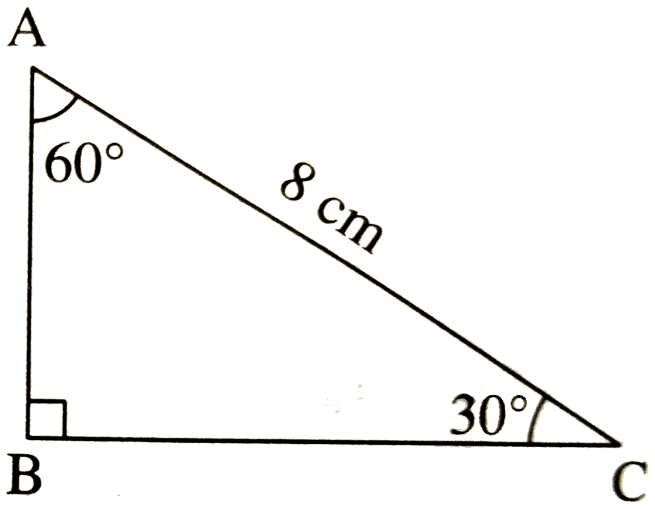
3. In the figure, $AC = 8cm$, $\angle ABC = 90^\circ$. $\angle BAC = 60^\circ$, $\angle ACB = 30^\circ$. Complete the following activity to find AB and BC.



In ΔABC,

By $30^\circ - 60^\circ - 90^\circ$ triangle theorem,

$\therefore AB = \frac{1}{2} \times AC$ and $BC = \quad - AC$

$\therefore AB = \frac{1}{2} \times 8$ and $BC = \quad - \quad \times 8$

$\therefore AB = \square\, cm$ and $BC = \square\, cm$

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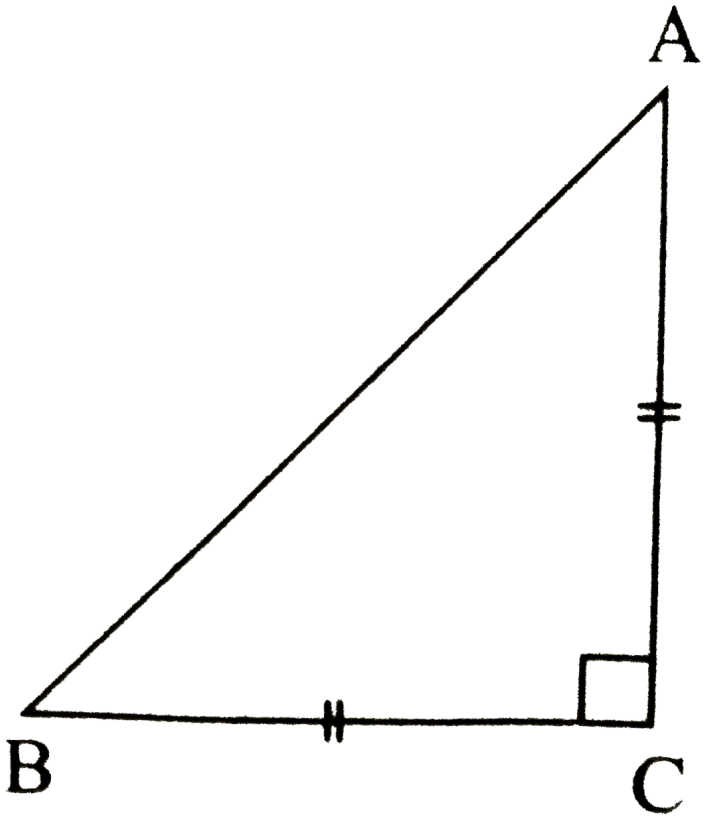
4. In ΔABC, $AC = BC$ and $\angle ACB = 90^\circ$ then prove $AB^2 = 2AC^2$



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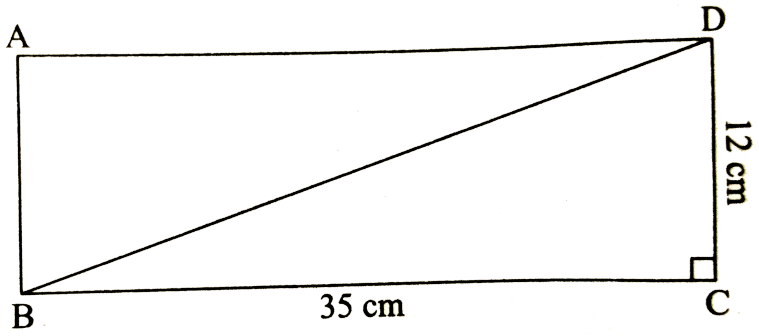
5. Find the diagonal of a rectangle whose length is $35cm$ and breadth is $12cm$.



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6. In order to prove, "In a right angled triangle, the perpendicular segment to the hypotenuse from the opposite vertex, is the geometric mean of the

segments into which the hypotenuse is divided."

(i) Draw a neat labelled figure.

(ii) Write 'Given' and 'To prove' from the figure drawn by you.

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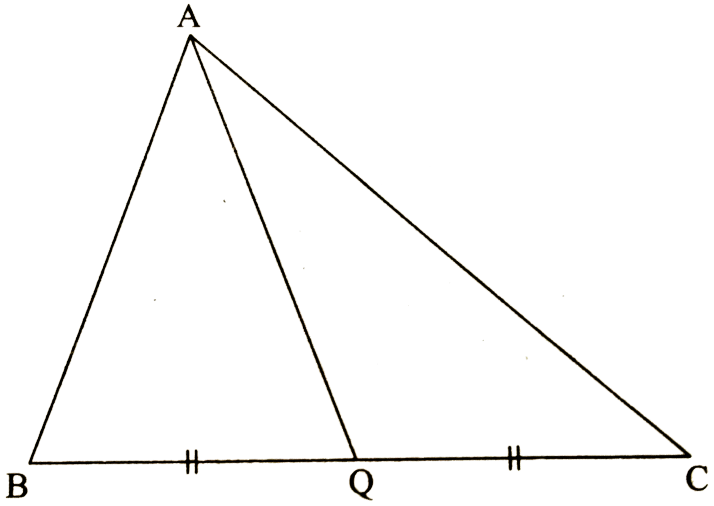
7. Complete the following activity to find the length of median AQ on side BC, if $AB^2 + AC^2 = 122$ and $BQ = 5$.



In ΔABC,

seg AQ is the median,

$AB^2 + \square = 2AQ^2 + 2BQ^2$.....(Apollonius theorem)

$\therefore 122 = 2AQ^2 + 2(5)^2$

$\therefore 2AQ^2 = 122 - \square$

On simplifying, $\therefore AQ^2 = \square$

$\therefore AQ = \square$ .....(Taking square roots on both the sides)

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8. With the help of the information given in the figure, fill in the boxes to find AB and BC.

$AB = BC$.....(Given)

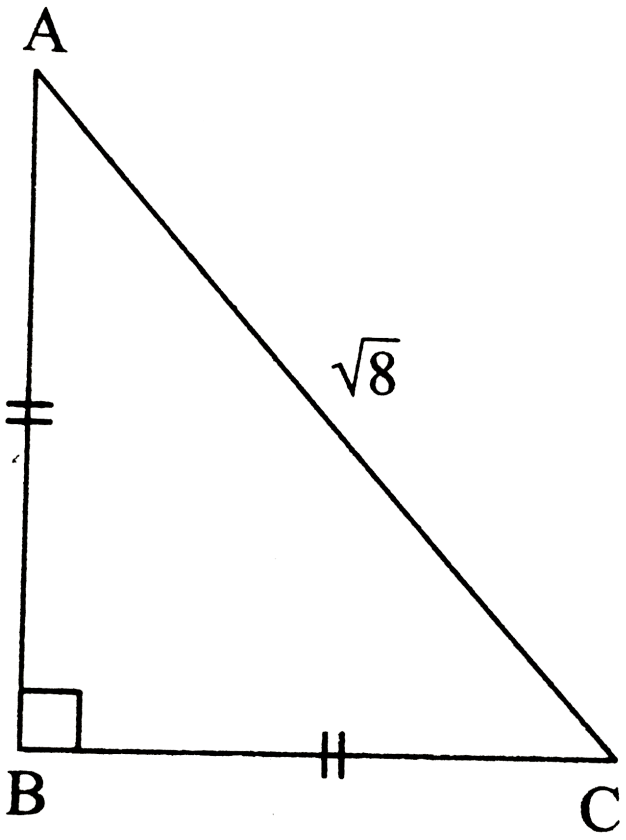
$\therefore \angle BAC = \angle BCA = \square$

$\therefore AB = BC = \square \times AC$

$= \square \times \sqrt{8}$

$= \square \times 2\sqrt{2}$

$= 2$



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3 4 3 Mark Each

1. $\square ABCD$ is a parallelogram. The diagonals AC and BD intersect at point M. The length of seg AC, AB and AD is 24, 22 and 34 respectively. Find the length of seg BD.

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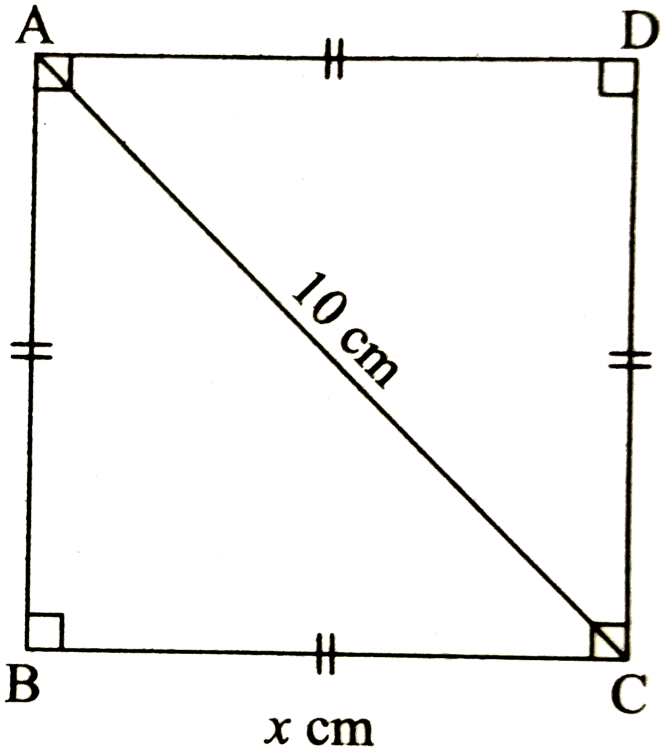
2. Find the side and perimeter of a square whose diagonal is $10cm$.



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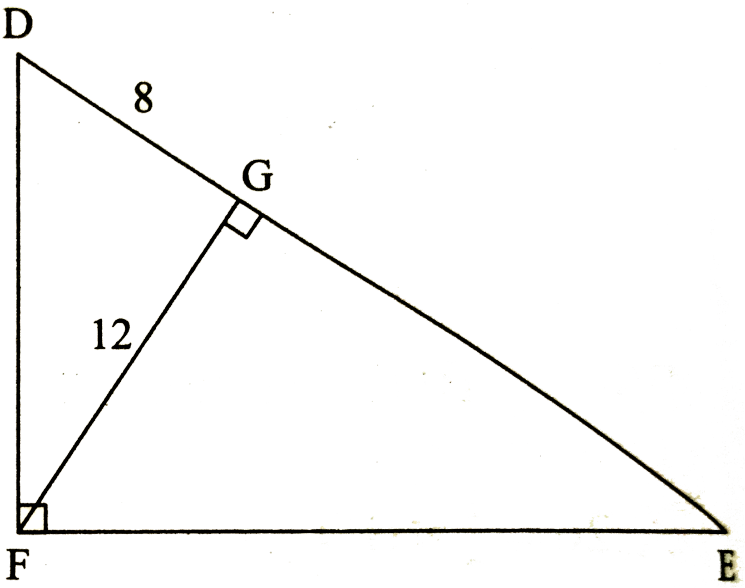
3. In the figure, $\angle DFE = 90^\circ$, seg $FG \perp$ side DE, $DG = 8$, $FG = 12$ then complete the following activity to find the length of seg DE.



In $\Delta DFE, \angle DFE = 90^\circ$,

seg $FG \perp$ hypotenuse DE

$\therefore$ by theorem of geometric mean,

$FG^2 = \square \times EG$

$\therefore 12^2 = \square \times EG$

$EG = \dfrac{12 \times 12}{\square}$

$\therefore EG = \square$

$DE = DG + GE = 8 + \square = \square$

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4. In the figure, M is the midpoint of QR. $\angle PRQ = 90^\circ$. Prove that $PQ^2 = 4PM^2 - 3PR^2$

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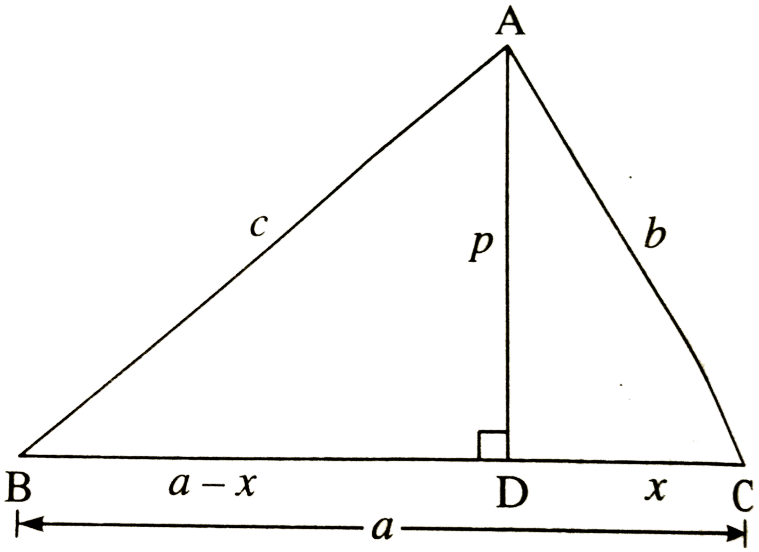
5. In ΔABC, $\angle C$ is an acute angle, seg $AD \perp$ seg BC. Prove $AB^2 = BC^2 + AC^2 - 2BC \times DC$ by completing the following activity.



Let $AB = c, AC = b, AD = p, BC = a, DC = x$

$\therefore BD = a - x$

In ΔADB, by Pythagoras theorem,

$c^2 = (a - x)^2 + \square$

$c^2 = a^2 - 2ax + x^2 + \square$ .....(1)

In ΔADC, by Pythagoras theorem,

$b^2 = p^2 + \square$

$p^2 = b^2 - \square$ .....(2)

Substituting value of p^2 from (2) in (1)

$c^2 = a^2 - 2ax + x^2 + \square$

$c^2 = a^2 + b^2 - \square$

$\therefore AB^2 = BC^2 + AC^2 - 2BC \times DC.$

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6. In ΔPQR, seg PM is median. $PM = 9$, $PQ^2 + PR^2 = 290$ then find length of seg QR.

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7. The perpendicular sides of a right angled triangle are $3x$ and $4x$. The length of its hypotenuse is 30. Find the lengths of the perpendicular sides of the right angled triangle.

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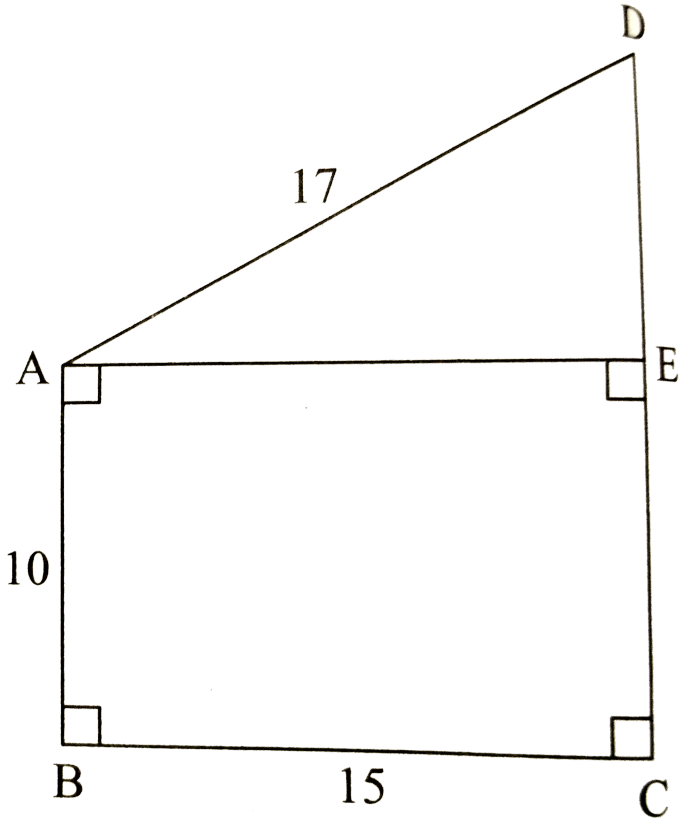
8. In the figure, $AD = 17$, $AB = 10$, $BC = 15$. $\angle ABC = \angle BCD = 90^\circ$ seg $AE \perp$ side CD

then find the length of $(i)AE\ (ii)DE\ (iii)DC.$



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9. In ΔRST, $\angle S = 90^\circ$. $\angle T = 30^\circ$, $RT = 12cm$, then find RS and ST.

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3 5 4 Mark Each

1. Walls of two buildings on either side of a street are parallel to each othe. A ladder $5.8m$ long is placed on the street such that its top just reaches the window of a building at the height of $4m$. On turning the ladder over to the other side of the street, its top touches the window of the other

building at a height $4.2m$. Find the width of the street.

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2. In the adjoing figure, seg PS is the median of $\Delta PQR$and $PT \perp QR$.

i. $PR^2 = PS^2 + QR \times ST + \left(\frac{QR}{2}\right)^2$

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3. Prove that the sum of the squares of the diagonals of parallelogram is equal to the sum of

the squares of its sides.

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4. ΔABC is an equilateral triangle. Point D is on side BC such that $BD = \frac{1}{5}BC$ then prove $25AD^2 = 21AB^2$.

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Assignment 3 1

1. In ΔLMN, if $LM = 10cm$ and $\angle LNM = 90^\circ$, $\angle LMN = 30^\circ$, then $NM = ?$

A. $5\sqrt{2}$

B. $5cm$

C. $10\sqrt{3}cm$

D. $5\sqrt{3}cm$

Answer:

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2. Two poles of height $100m$ and $111m$ stand vertically upright on the surface of the levelled ground. If the distance between their bases is $60m$, what is the distance between their tops?

A. $61m$

B. $60m$

C. $100m$

D. $111m$

Answer:

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3. What is the length of a digonal of a square of side $10cm$?

A. $10\sqrt{3}cm$

B. $10\sqrt{2}cm$

C. $10cm$

D. $5\sqrt{2}cm$

Answer:

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4. If two sides of the right angled triangle are 3 and 4, then what is the length of the third side?

A. 5

B. $\sqrt{7}$

C. 5 or $\sqrt{7}$

D. none of these

Answer:

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5. Kartik and Pravin start cycling from some point A . Kartik travels due east and Pravin travels due north. After 1 hour, Pravin covers 12km and Kartik travels $5km$. How far are they from each other?

A. $12km$

B. $5km$

C. $13km$

D. $17km$

Answer:

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6. If in ΔABC, seg AM is the median, $AB^2 + AC^2 = 410$ and $BC = 12$ then $AM = ?$

A. 12

B. 13

C. $\sqrt{17}$

D. $\sqrt{13}$

Answer:

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7. The length of the hypotenuse PR of an isosceles right angled triangle PQR, where PQ is $4cm$, is

A. $4cm$

B. $4\sqrt{3}cm$

C. $4\sqrt{2}cm$

D. $16cm$

Answer:

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8. ΔPQR is an equilateral triangle having length of side as $8cm$. Find the height of ΔPQR.

A. $2\sqrt{3}cm$

B. $4\sqrt{8}cm$

C. $3\sqrt{2}cm$

D. $4\sqrt{3}cm$

Answer:

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Assignment 3 2

1. Observe the triplet $(11, 12, 17)$. State whether it is a Pythagorean triplet or not.

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2. In $\Delta PQR, PQ^2 = PR^2 + QR^2$ then state which angle will be the right angle.

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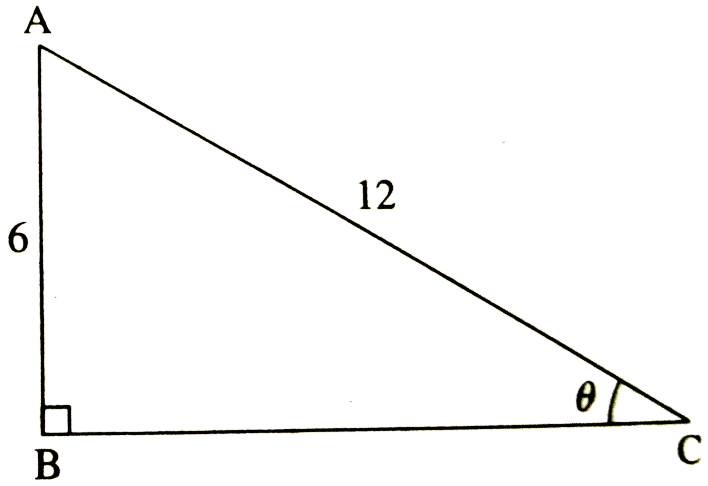
3. In the figure , $AB = 6$ and $AC = 12$, then what is the value of θ? Why



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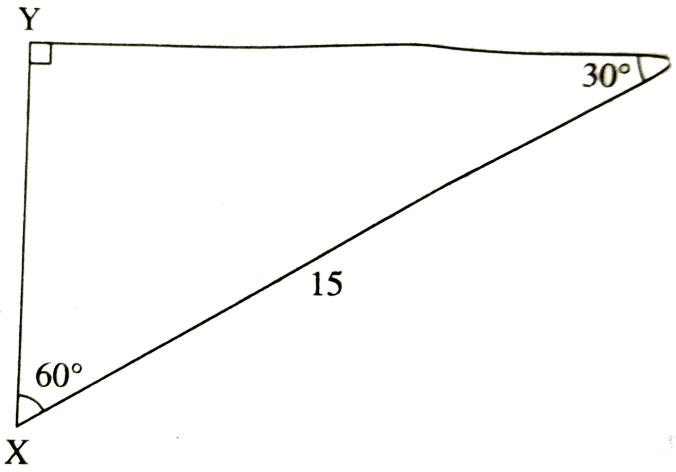
4. In ΔXYZ, $XZ = 15$, $\angle YZX = 30^\circ$, $\angle YXZ = 60^\circ$ then $XY =$ .....and $YZ =$ .....



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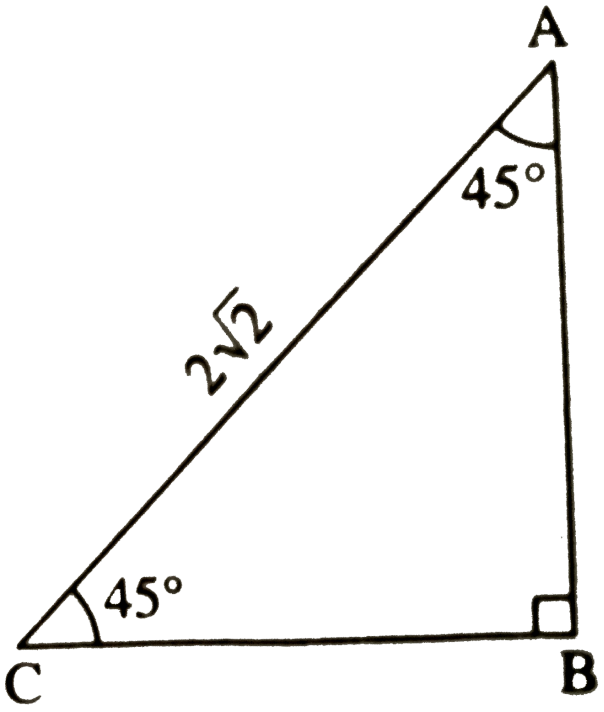
5. In ΔABC, $\angle BAC = \angle BCA = 45^\circ$, $\angle ABC = 90^\circ$ then the value of AB.



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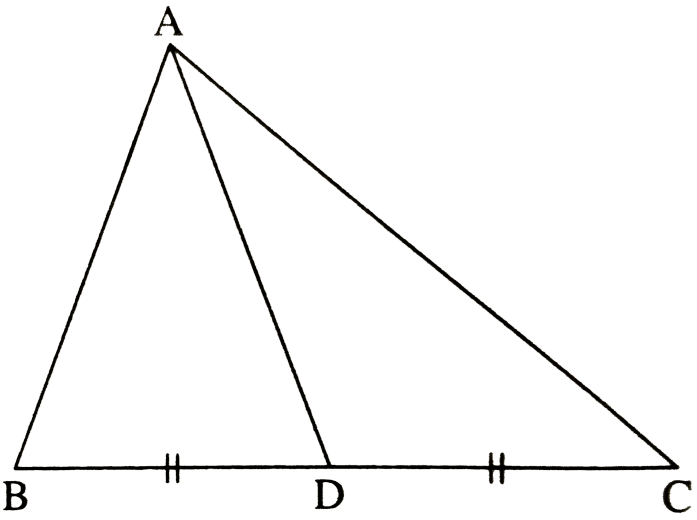
6. In ΔABC, D is the midpoint of side BC. Fill in the boxes with correct answer

$AB^2 + AC^2 = \square + \square.$



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Assignment 3 3

1. Is $(5, 12, 13)$ a Pythagorean triplet ? Give reason.

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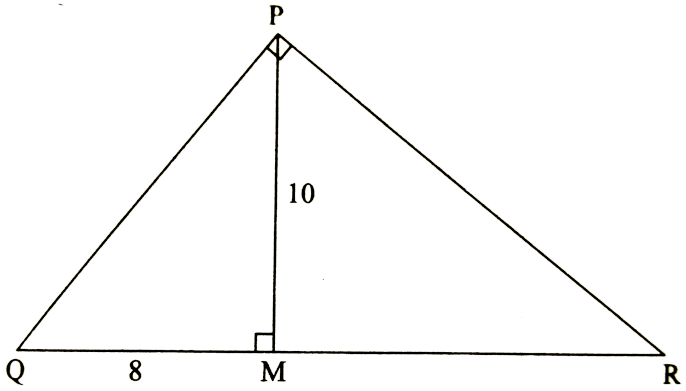
2. In the figure, $\angle QPR = 90^\circ$, seg $PM \perp$ seg QR and $Q - M - R, PM = 10. QM = 8$, find QR.



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3. In ΔABC, $\angle ABC = 90^\circ$, $AB = 12$, $BC = 16$ and seg BP is the median drawn to side AC. Find

the length of seg BP.

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4. Do sides $7cm$, $24cm$, $25cm$ form a right angled triangle? Give reason.

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5. Find the length of a diagonal of a rectangle having sides $11cm$ and $60cm$.

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6. Find the length of the hypotenuse of a right angeled triangle, if the remaining sides are $9cm$ and $12cm$.

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7. Find the side of a square whose diagonal is $16\sqrt{2}cm$.

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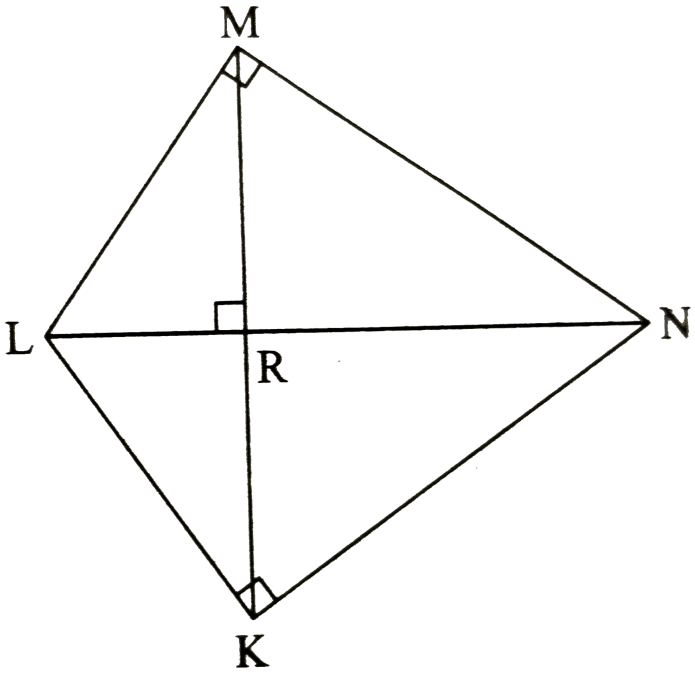
8. In the figure, $\angle LMN = \angle LKN = 90^\circ$

seg $MK \perp$ seg LN.

Complete the following activity to prove R is the midpoint of seg MK.



Proof: In $\Delta LMN, \angle LMN = 90^\circ$

seg $MR \perp$ hypotenuse LN

$\therefore$ by property of geometric mean,

$MR^2 = \square \times RN$

In $\Delta LKN, \angle LKN = 90^\circ$

seg $KR \perp$ hypotenuse LN

$\therefore$ by property of geometric mean,

$KR^2 = LR \times \square$

From (1) and (2), we get

$MR^2 = \square \therefore MR = \square.$

$\therefore R$ is the midpoint of seg MK.

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9. In order to prove, 'In a right angled triangle, the square of the hypotenuse is equal to the sum of

the squares of remaining two sides

(i) Draw a near labelled figure.

(ii) Write 'Given' and 'To Prove' from the figure drawn by you.

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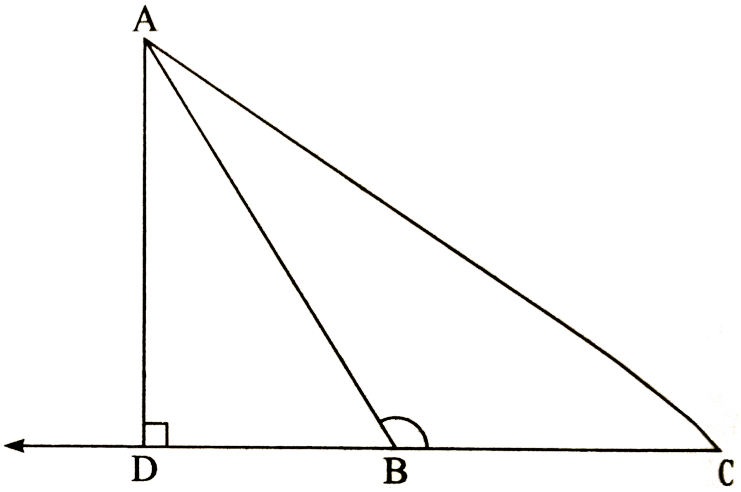
Assignment 3 4

1. In obtuse angled ΔABC, $\angle B > 90^\circ$. If seg $Ad \perp$ ray CB and $D - B - C$, then prove that

$AC^2 = AB^2 + BC^2 + 2BC \cdot DB.$



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2. Find the length of the side and perimeter of an equilateral triangle whose height is $4\sqrt{3}cm.$

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3. Find the diagonal of a rectangle whose length is $16cm$ and area $192sqcm$.

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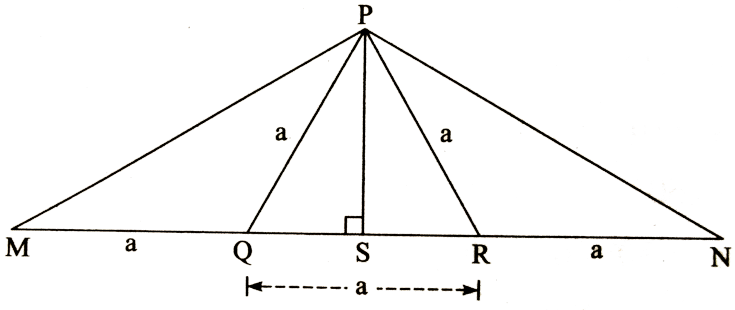
4. From the information given in the figure, prove that

$PM = PN = \sqrt{3} \times a.$



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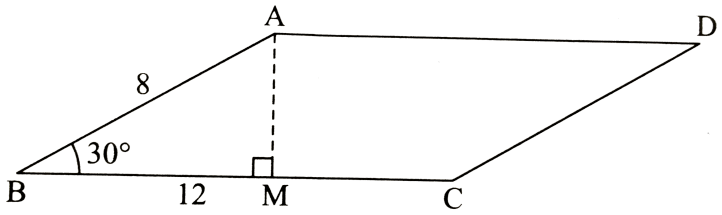
5. In the figure, $\square ABCD$ is a parallelogram. $AB = 8$, $BC = 12$ and $\angle B = 30^\circ$. Find $Area(ABCD)$.



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6. D is the midpoint of side BC of ΔABC. If $AB = 4$, $AC = 6$ and $BC = 8$, then find $l(AD)$ and hence perimeter of ΔABD.

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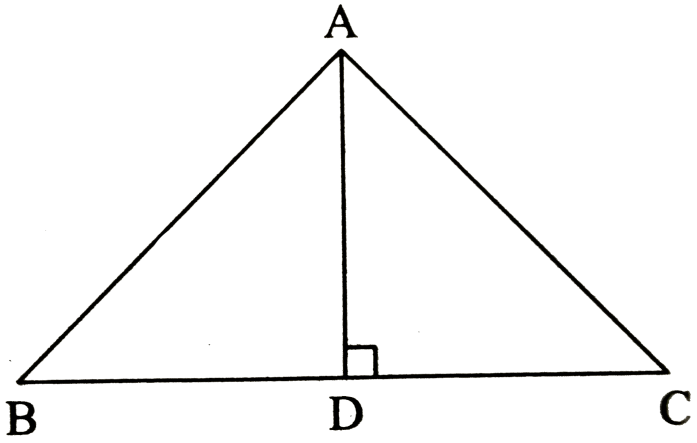
7. In the figure, seg $AD \perp$ side BC and $B - D - C$, then prove $AB^2 - BD^2 = AC^2 - CD^2$.



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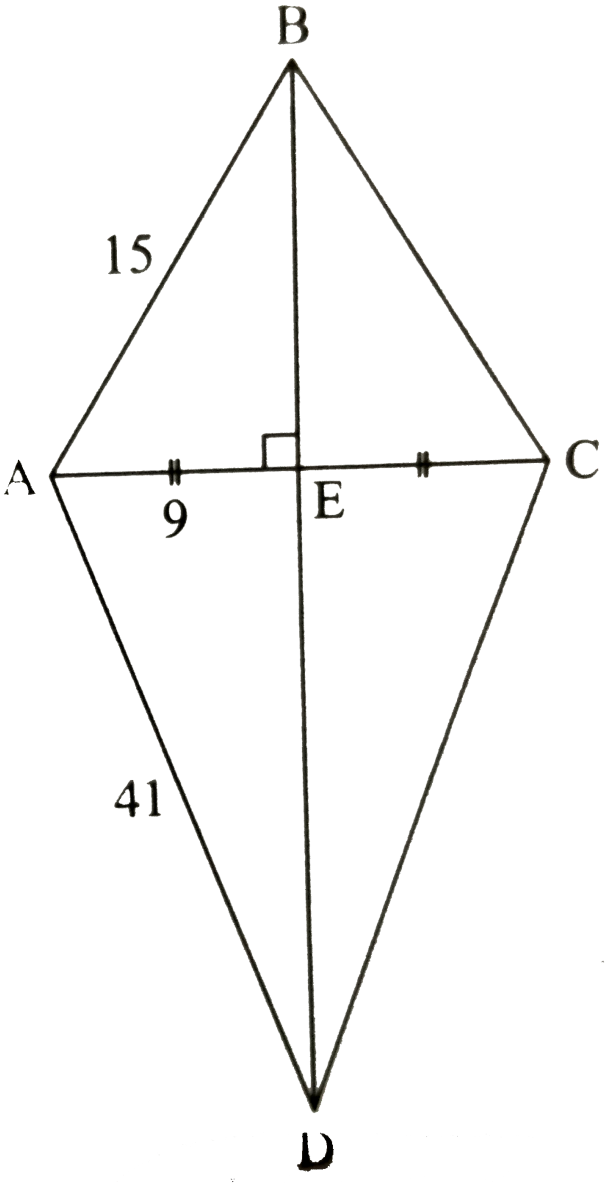
8. In the figure, smaller diagonal AC of a kite $ABCD$ is $18cm$ long. $AB = 15cm$ and $AD = 41cm$. Find the length of

$(i) BE$

$(ii) ED$

$(iii) BD$



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9. In an equilateral $\triangle ABC, AD$ is the altitude drawn from A on the side BC. Prove that $3AB^2 = 4AD^2$

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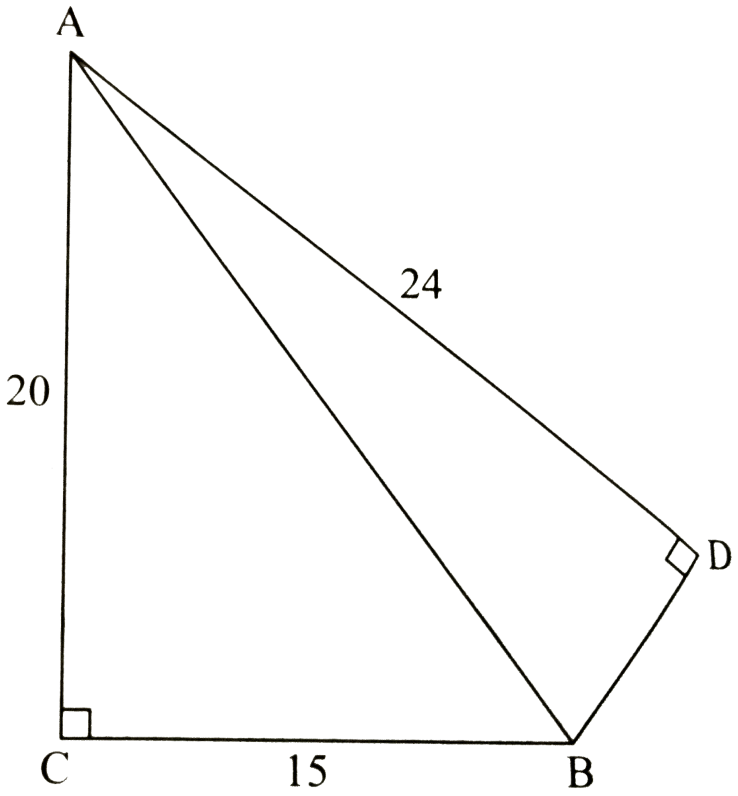
10. In the figure,

$AC = 20, CB = 15, AD = 24.$

Find AB and BD.



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11. Ramesh goes $24km$ to south, then turns and goes to west for $10km$

(i) From the given information, drw a proportionate figure.

(ii) If starting point and end point are joined, then which type triangle do we get?

(iii) At last how far is he from the starting point?

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12. ΔPQR is an equilateral triangle. Seg $PS \perp$ side QR such that $Q - S - R$. Prove $PS^2 = 3QS^2$ by completing the following activity.

In ΔPQS,

$\angle PSQ = \square$ .....(Given)

$\angle Q = \square$ .....(Angle of an equilateral triangle)

$\therefore \angle QPS = 30^\circ$ .....(Remaining angle of ΔPQS)

$\therefore \Delta PQS$ is a $\square$ triangle

$PS = \square PQ$.....(Side opposite to 60°).....(1)

and $QS = \square PQ$.....(Side opposite to 30°)

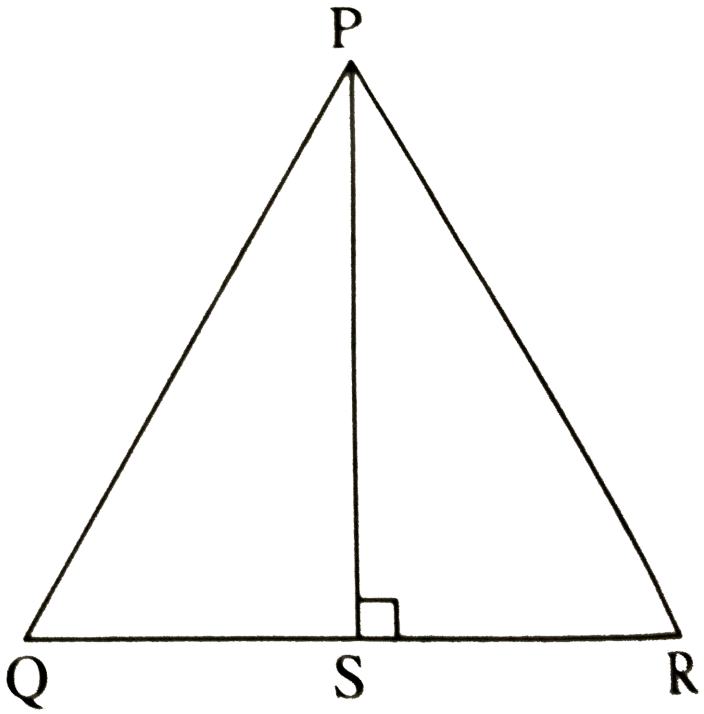
$PQ = 2QS$ .....(2)

Substituting value of PQ from (2) in (1)

$PS = \dfrac{\sqrt{3}}{2} \times 2QS$

$\therefore PS = \square QS$

$\therefore PS^2 = 3QS^2$.....(Square both the sides)



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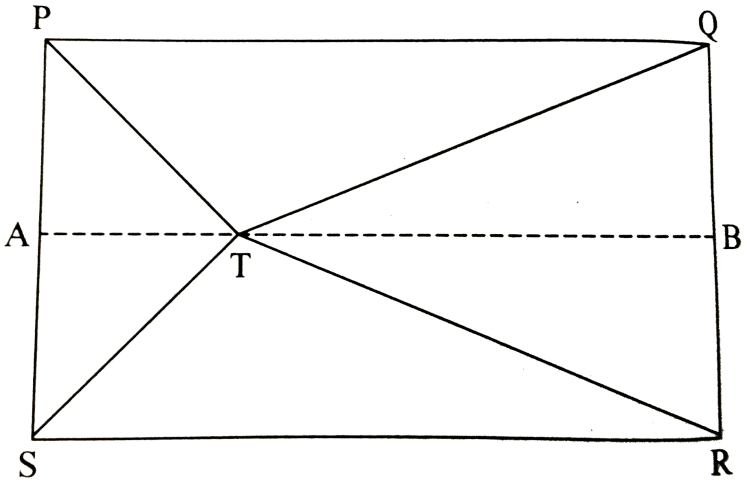
Assignment 3 5

1. In the figure , point T is in the interior of rectangle $PQRS$.

Prove that,

$TS^2 + TQ^2 = TP^2 + TR^2$

(As shown in the figure, draw seg $AB \parallel$ side SR and $A - T - B$.)



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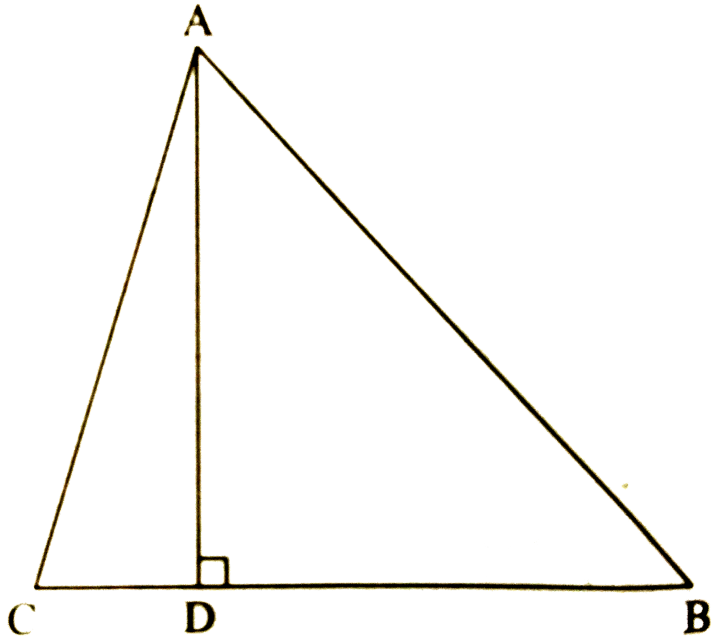
2. In ΔABC,

seg $AD \perp$ seg BC,

$DB = 3CD$.

Prove that $2AB^2 = 2AC^2 + BC^2$.



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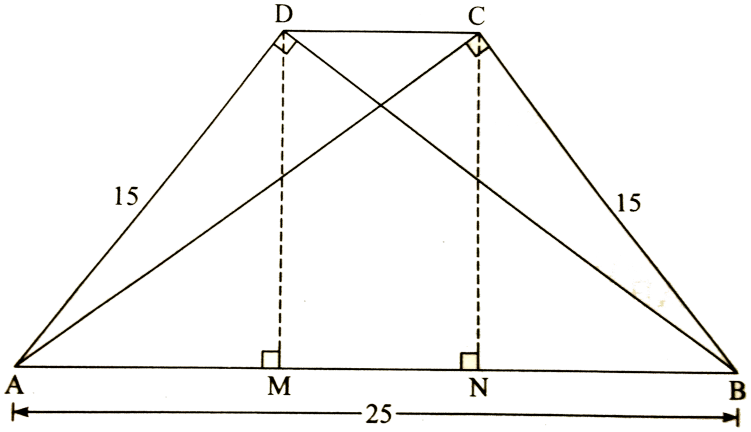
3. In a trapezium $ABCD$, seg AB $||$ seg DC, seg $BD \perp$ seg AD, seg $AC \perp$ seg BC, if $AD = 15$, $BC = 15$ and $AB = 25$. Find $A(\square ABCD)$.



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4. Show that if the diagonals of a quadrilateral cut each other in a right angle, then the sum of the squares of opposite sides are equal.

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5. Starting from Madhav's house, John first goes $12m$ north, then $73m$ west, then $67m$ south and finally $25m$ east and reaches Mohamad's house. The what is the direct distance between Madhav's and Mohamad's houses?

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Examples For Practice 1 Mark Multiple Choice Questions

1. Out of the given triplets , which is not a Pythagorean triplet ?

A. (104,96,40)

B. $(52, 20, 48)$

C. $(32, 15, 30)$

D. (61,60,11)

Answer: D

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2. In ΔLMN, if $LM = 10cm$ and $\angle LNM = 90^\circ$, $\angle LMN = 30^\circ$, then $NM = ?$

A. $5\sqrt{2}$ cm

B. 5 cm

C. $10\sqrt{3}$ cm

D. $5\sqrt{3}$cm

Answer: D

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3. Two poles of height $100m$ and $111m$ stand vertically upright on the surface of the levelled ground. If the distance between their bases is $60m$, what is the distance between their tops?

A. 61 m

B. 60 m

C. 100 m

D. 111 m

Answer: A

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4. ΔPQR is an equilateral triangle. Seg $PS \perp$ side QR such that $Q - S - R$. Prove $PS^2 = 3QS^2$ by completing the following activity.

In ΔPQS,

$\angle PSQ = \square$ .....(Given)

$\angle Q = \square$ .....(Angle of an equilateral triangle)

$\therefore \angle QPS = 30^\circ$ .....(Remaining angle of ΔPQS)

$\therefore \Delta PQS$ is a $\square$ triangle

$PS = \square PQ$.....(Side opposite to 60°).....(1)

and $QS = \square PQ$.....(Side opposite to 30°)

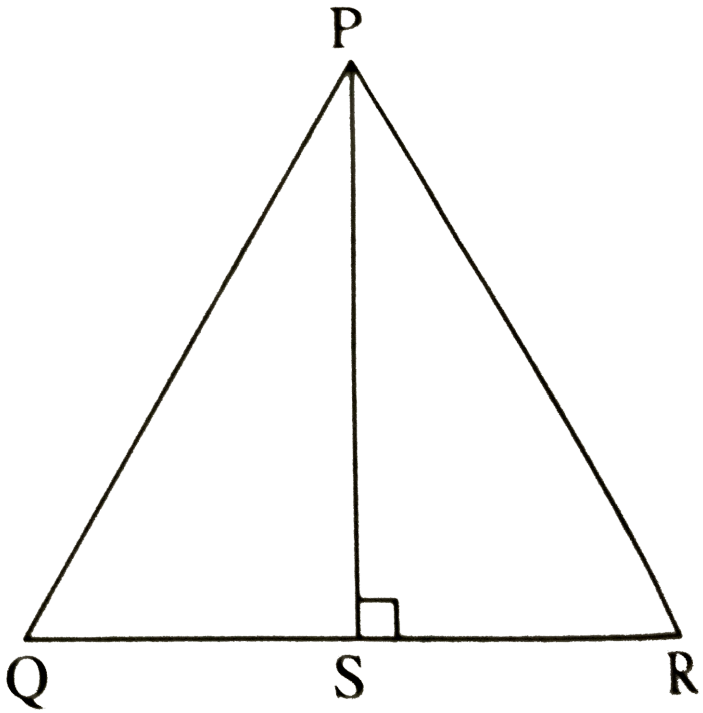
$PQ = 2QS$ .....(2)

Substituting value of PQ from (2) in (1)

$PS = \frac{\sqrt{3}}{2} \times 2QS$

$\therefore PS = \square QS$

$\therefore PS^2 = 3QS^2$.....(Square both the sides)



A. $4QS^2$

B. $3QS^2$

C. $\frac{3}{2}QS^2$

D. $2QS^2$

Answer: B

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5. Find the diagonal of a square whose side is 10 cm.

A. $10\sqrt{3}$ cm

B. $10\sqrt{2}cm$

C. $10cm$

D. $5\sqrt{2}$ cm

Answer: B

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6. In and $segBD$ bot $sideAC$ and AD=DC` then .....

A. $BD^2 = DC \times AC$

B. $BD^2 = AD \times AC$

C. $BD^2 = DC \times AC$

D. none of these

Answer: A

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7. If two sides of the right angled triangle are 3 and 4, then what is the length of the third side?

A. 5

B. $\sqrt{7}$

C. 5 or $\sqrt{7}$

D. none of these

Answer: C

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8. Kartik and Pravin start cycling from some point A . Kartik travels due east and Pravin travels due north. After 1 hour, Pravin covers 12km and Kartik travels $5km$. How far are they from each other?

A. 12 km

B. 5 km

C. 13 km

D. cannot be determined

Answer: C

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9. If in ΔABC, seg AM is the median, $AB^2 + AC^2 = 410$ and $BC = 12$ then $AM = ?$

A. 12

B. 13

C. $\sqrt{12}$

D. $\sqrt{13}$

Answer: B

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10. The length of the hypotenuse PR of an isosceles right angled triangle PQR, where PQ is $4cm$, is

A. 4 cm

B. $4\sqrt{3}$ cm

C. $4\sqrt{2}$ cm

D. 16 cm

Answer: C

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11. Out of the following which is a Pythagorean triplet?

A. (5,12,14)

B. (3,4,2)

C. (8,15,17)

D. (5,5,2)

Answer: C

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Examples For Practice 2 Mark Questions

1. In right angled triangle , the lengtj of the perpendicular sides are 15 cm and 8 cm . Find the length of its hypotenuse .

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2. If the sides of the triangle are 12, 35 and 37 , determine whether the triangle is a right angled triangle . Justify.

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3. 10 m लंबी एक सीढी एक दीवार पर टिकाने पर भूमि से 8 m की उँचाई पर स्थित एक खिड़की तक पहुँचती है । दीवार के आधार से सीढी के निचले सिरे की दूरी ज्ञात कीजिए ।

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4. Determine whether (11,12,15) is a Pythagorean triplet ? Justify .

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5. Find the side of a square whose diagonal is $16\sqrt{2}cm.$

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6. Find the perimeter of an isosceles right angled triangle with each of its congruent sides as 7 cm .

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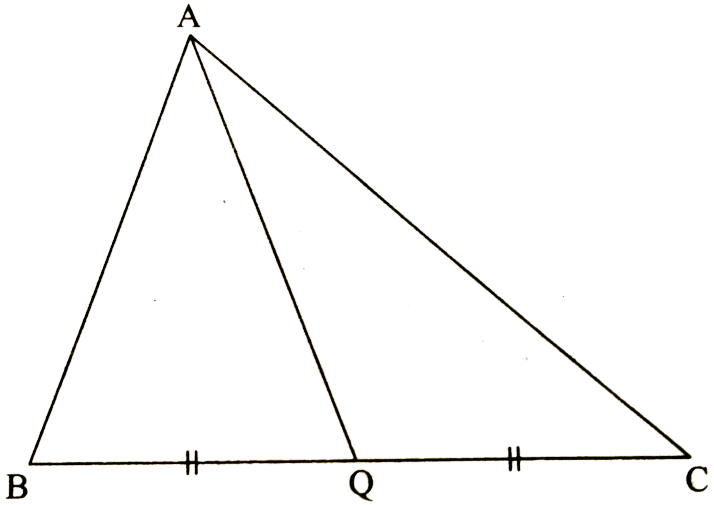
7. Complete the following activity to find the length of median AQ on side BC, if $AB^2 + AC^2 = 122$

and $BQ = 5$.



In ΔABC,

seg AQ is the median,

$AB^2 + \square = 2AQ^2 + 2BQ^2$.....(Apollonius theorem)

$\therefore 122 = 2AQ^2 + 2(5)^2$

$\therefore 2AQ^2 = 122 - \square$

On simplifying, $\therefore AQ^2 = \square$

$\therefore AQ = \square$ .....(Taking square roots on both the sides)

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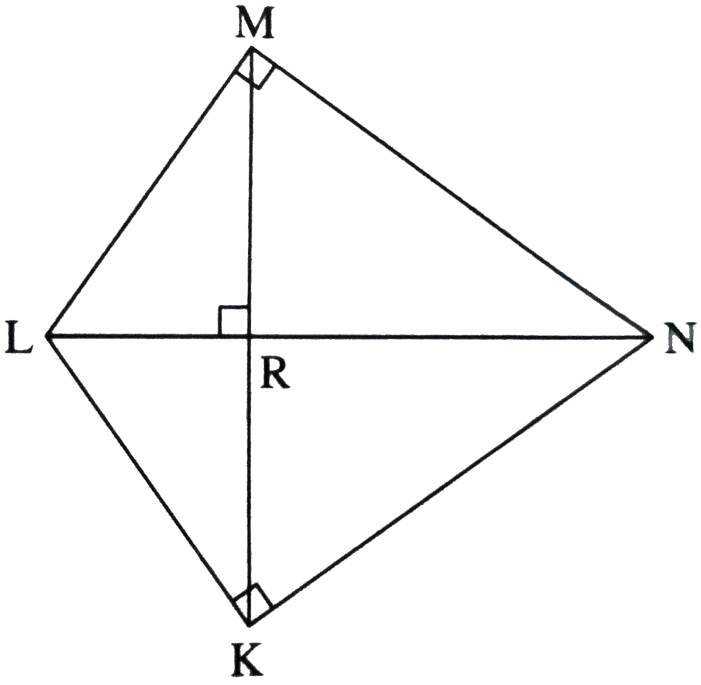
8. In the figure , $\angle LMN = \angle LKN = 90^\circ$

seg MK $\perp$ seg LN .

Complete the following activtiy

to prove R is the midpoint of seg MK .



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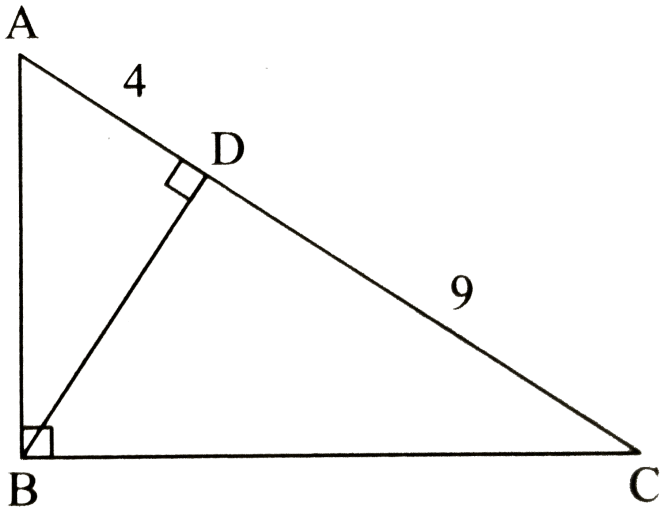
9. In right angled ΔABC, $BD \perp AC$. If $AD = 4$, $DC = 9$, then find BD.



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Examples For Practice 3 Mark Questions

1. किसी समबाहु त्रिभुज में , सिद्ध कीजिए कि उसकी एक भुजा के वर्ग का तिगुना उसके एक शीर्षलंब के वर्ग के चार गुने के बराबर होता है ।

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2. In ΔPQR, seg PM is median. $PM = 9$, $PQ^2 + PR^2 = 290$ then find length of seg QR.

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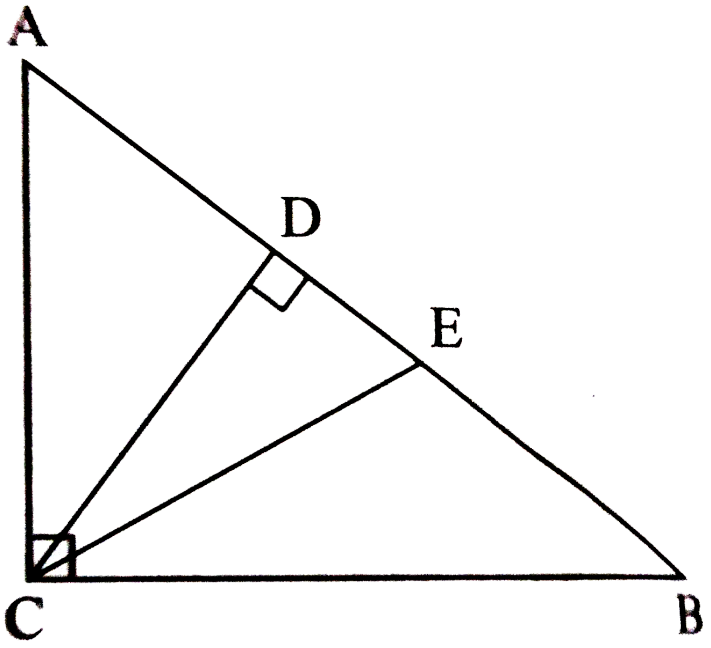
3. In ΔABC, $\angle ACB = 90^\circ$, seg $CD \perp$ side AB and seg CE is angle bisector of $\angle ACB$

Prove : $\frac{AD}{BD} = \frac{AE^2}{BE^2}$



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4. In right angled $\Delta BAC, \angle BAC = 90^\circ$,segments AD, BE and CF are medians.Prove that $2\left(AD^2 + BE^2 + CF^2\right) = 3BC^2$

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5. Three times the sum of square of the sides of a triangle is equal to four times the sum of the square of the medians of the triangle.

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6. Suppose m and n are any two numbers . If $m^2 - n^2$, 2mn and $m^2 + n^2$ are the three sides of a triangle , then show that it is a right angled triangle and hence write any two pairs of Pythagorean triplet .

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7. Show that if the diagonals of a quadrilateral cut each other in a right angle, then the sum of the squares of opposite sides are equal.

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8. Starting from Madhav's house, John first goes $12m$ north, then $73m$ west, then $67m$ south and finally $25m$ east and reaches Mohamad's west , then $67m$ south and finally $25m$ east and reaches

Mohamad's house. The whast is the direct distance between Madhav's and Mohamad's houses?

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Examples For Practice 2 Mark Questions

1. Each side of a rhombus is 10 cm long and one of its diagonals measures 16 cm. Find the length of the other diagonal and hence find the area of the rhombus.

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2. Adjacent sides of a parallelogram are 11 cm and 17 cm. If the length of one of its diagonal is 26 cm, find the length of the other.

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Practice Set 2 1

1. Idenetify , with reason , which of the following are Pythagorean triplets :

(3,5,4)

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2. Idenetify , with reason , which of the following are Pythagorean triplets :

$(4, 9, 12)$

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3. Is $(5, 12, 13)$ a Pythagorean triplet ? Give reason.

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4. Idenetify , with reason , which of the following are Pythagorean triplets :

(24,70,74)

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5. Idenetify , with reason , which of the following are Pythagorean triplets :

(10,24,27)

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6. Idenetify , with reason , which of the following are Pythagorean triplets :

(11,60,61)

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7. In the adjoining figure, $\angle MNP = 90^\circ$, $segNQ \perp segMP$,MQ=9,QP=4 find NQ.

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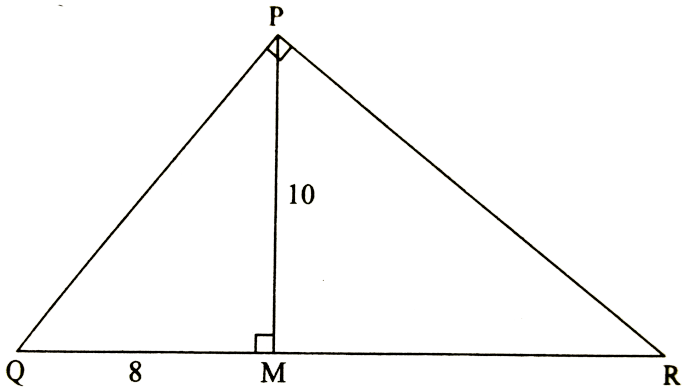
8. In the figure, $\angle QPR = 90^\circ$, seg $PM \perp$ seg QR and $Q - M - R, PM = 10. QM = 8$, find QR.



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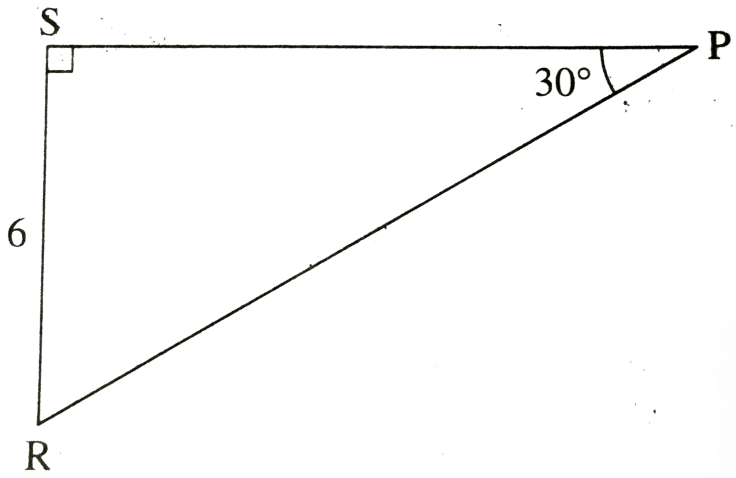
9. See fiugre Find RP and PS using the ingormation given in $\triangle$ PSR



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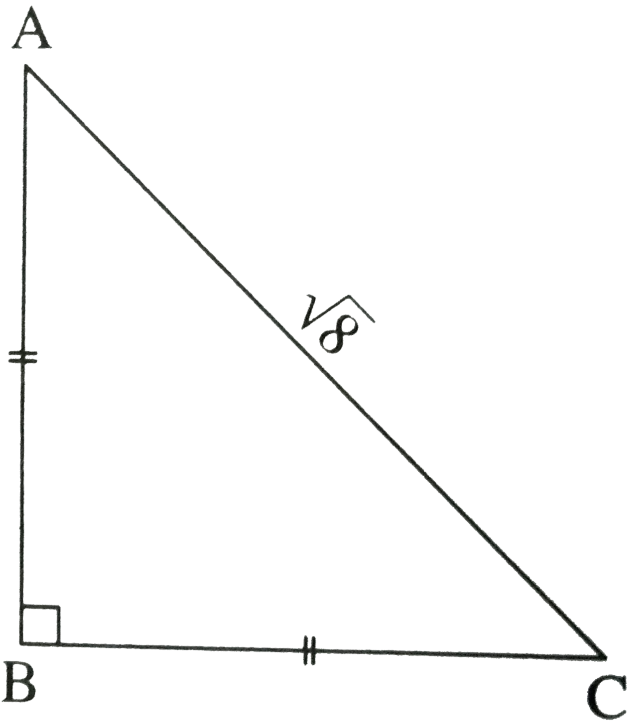
10. For finding AB and BC with the help of information given in figure , complete following

activity :



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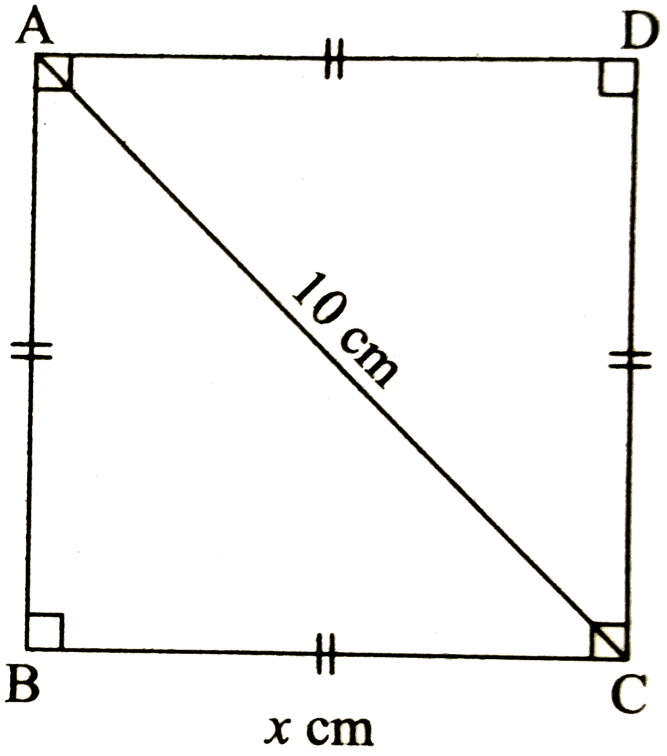
11. Find the side and perimeter of a square whose diagonal is $10cm$.



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12. In the adjoining figure, $\angle DFE = 90^\circ$, $FG \perp ED$. $If GD = 8, FG = 12,$ find

(i) EG

(ii) FD, and

(iii) EF

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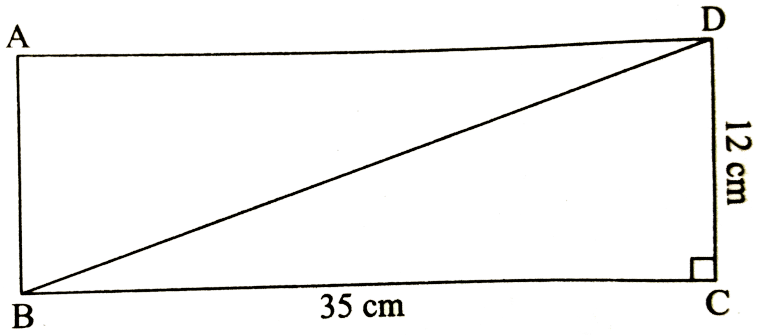
13. Find the diagonal of a rectangle whose length is $35cm$ and breadth is $12cm$.



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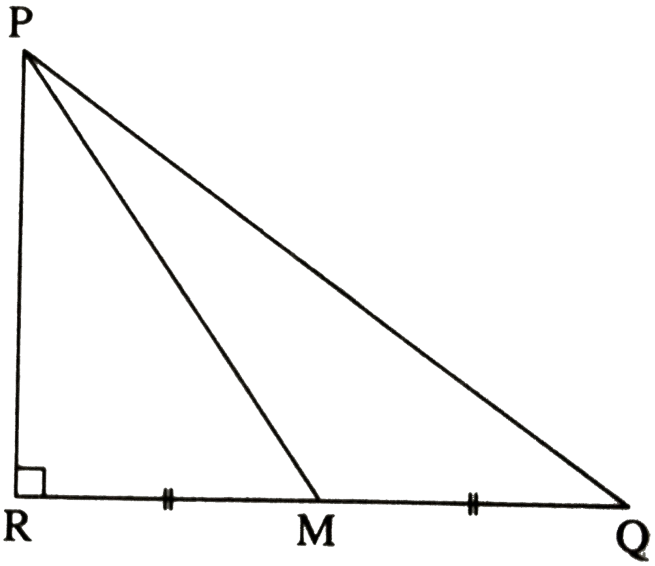
14. In the figure , M is the midpoint of QR .

$\angle PRQ = 90^\circ$.

Prove that ,

$PQ^2 = 4PM^2 - 3PR^2$.



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15. Walls of two buildings on either side of a street are parallel to each othe. A ladder $5.8m$ long is placed on the street such that its top just reaches the window of a building at the height of $4m$. On turning the ladder over to the other side of the street, its top touches the window of the other building at a height $4.2m$. Find the width of the street.

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Practice Set 2 2

1. In $\Delta PQR,$ point S is the midpoint of side QR. If PQ =11, PR =17 PS =13 , find QR.

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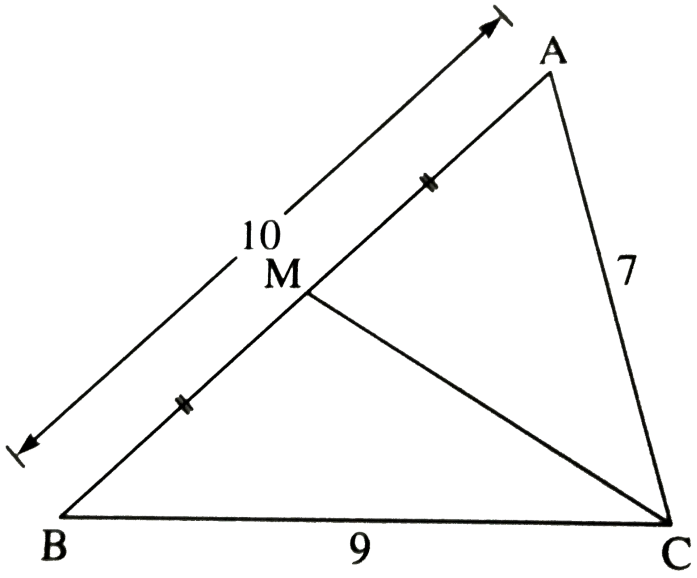
2. In $\triangle ABC$, $AB = 10$

$AC = 7, BC = 9$

then find the length find the length of the median

drawn from point C to side AB .



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3. In

ΔPQR seg PS is median of ΔPQR. And $PT \perp QR$,

(i) $PR^2 = PS^2 + QR \times ST + \left(\frac{QR}{2}\right)^2$

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4. In ΔABC, point M is the midpoint of BC, $AB^2 + AC^2 = 290cm$, AM=8cm,find BC.

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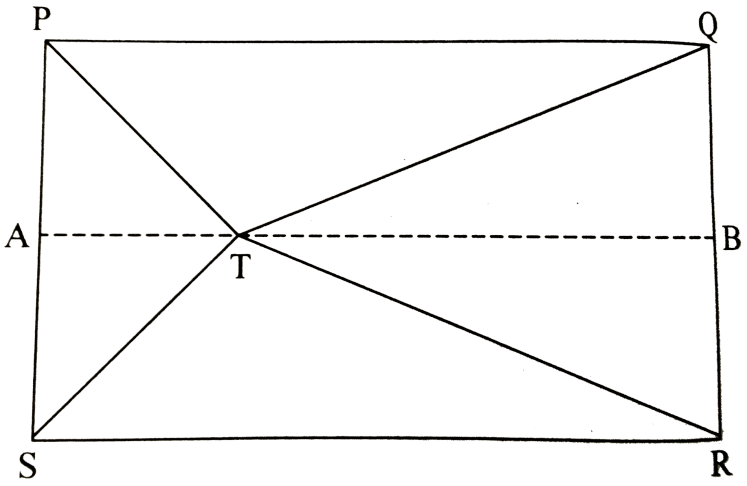
5. In the figure , point T is in the interior of rectangle $PQRS$.

Prove that,

$TS^2 + TQ^2 = TP^2 + TR^2$

(As shown in the figure, draw seg $AB \mid\mid$ side SR

and $A - T - B$.)



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Problem Set 2

1. Out of the following which is the Pythagorean triplet ?

A. (1,5,10)

B. (3,4,5)

C. (2,2,2)

D. (5,5,2)

Answer: B

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2. In a right angled triangle,if the sum of the squares of the sides making a right angle is 169, then what is the length of the hypotenuse?

A. 15

B. 13

C. 5

D. 12

Answer: B

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3. out of the dates given below which date constitutes a Pythagorean triplet?

A. $15/18/16$

B. $16/08/16$

C. $3/5/17$

D. $4/9/15$

Answer: A

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4. If a, b, c are sides of a triangle and $a^2 + b^2 = c^2$, then name the type of the triangle.

A. Obtuse angled triangle.

B. Acute angled triangle

C. Right engled triangle

D. Equilateral triangle

Answer: C

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5. Find the perimeter of a square, if its diagonal is $10\sqrt{2}cm.$

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6. Altitude on the hypotenuse of a right angled triangle triangle divides it in two parts of lengths 4 cm and 9 cm. Find the length of the altitude.

A. 9 cm

B. 4 cm

C. 6 cm

D. $2\sqrt{6}$ cm

Answer: C

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7. The height and base of a right angled triangle are $24cm$ and $18cm$, find the length of its hypotenuse.

A. 24 cm

B. 30 cm

C. 15 cm

D. 18 cm

Answer: B

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8. In $\Delta ABC, AB = 6\sqrt{3}cm, AC = 12cm$ and $BC = 6cm$. Then $\angle B$ is

A. 30°

B. 60°

C. 90°

D. 45°

Answer: A

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9. Find the length of the altitude of an equilateral triangle of side 2a cm.

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10. Do sides 7 cm , 24 cm , 25 cm from a right angled triangle ? Give reason .

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11. Find the length of a diagonal of a rectangle having sides $11cm$ and $60cm$.

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12. Find the length of the hypotenuse of a right angeled triangle, if the remaining sides are $9cm$ and $12cm$.

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13. A side of an isosceles right angled triangle is x. Find its hypotenuse.

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14. In $\Delta PQR, PQ = \sqrt{8}, QR = \sqrt{5}, PR = \sqrt{3}. Is \Delta PQR$ a right angled triangle? If yes, which angle is of 90° ?

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15. In $\Delta RST, \angle S = 90^\circ. \angle T = 30^\circ, RT = 12cm,$ then find RS and ST.

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16. Find the diagonal of a rectangle whose length is $16cm$ and area $192sqcm$.

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17. Find the length of the side and perimeter of an equilateral triangle whose height is $\sqrt{3}$ cm

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18. In ΔABC, seg AP is a median. If BC = 18, $AB^2 + AC^2 = 260$ then find the length of AP.

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19. ΔABC is an equilateral triangle. Point P is on base BC such that $PC = \frac{1}{3}BC$, if $AB = 6$ cm find AP.

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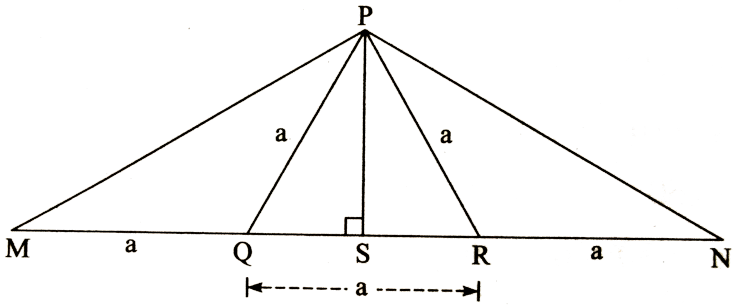
20. From the information given in the figure, prove that

$PM = PN = \sqrt{3} \times a.$



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21. Prove by vector method that the sum of the square of the diagonals of a parallelogram is equal to the sum of the squares of its sides.

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22. Paranali and Prasad started walking to the East and to the Noorth respectively, from the same point and at the same speed. After 2 hours distance between then was $15\sqrt{2}$km. Find their speed per hour.

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23. BL and CM are medians of a triangle ABC right angled at A. Prove that $4\left(BL^2+CM^2\right)=5BC^2$

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24. Sum of the squares of adjacent sides of a parallelogram is 130 cm length of one of its diagonals is 14 cm. Find the length of the other diagonal.

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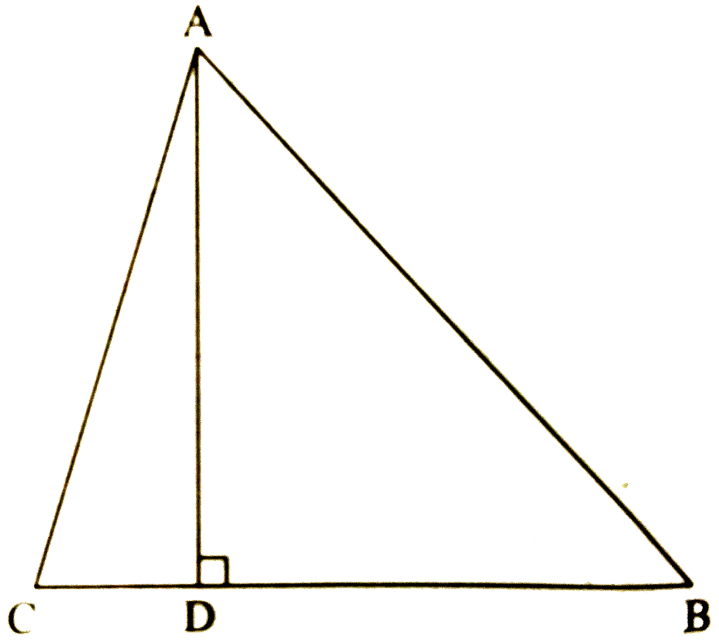
25. In ΔABC,

seg $AD \perp$ seg BC,

$DB = 3CD$.

Prove that $2AB^2 = 2AC^2 + BC^2$.



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26. In an isosceles triangle, length of the congruent sides is 13 cm and its base is 10 cm. Find the

distance between the vertex opposite the base and the centroid.

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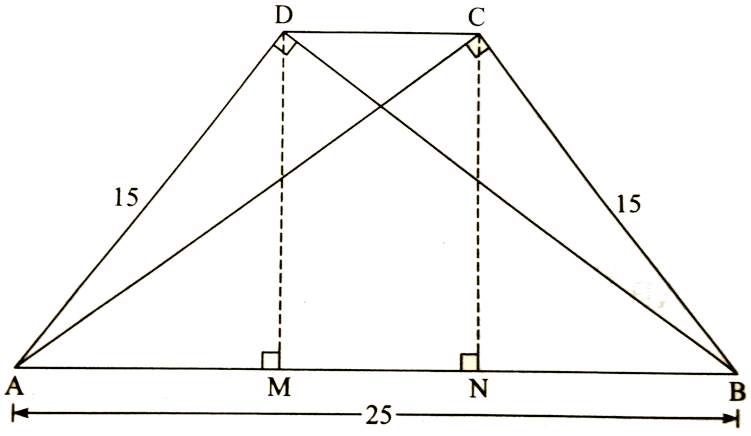
27. In a trapezium $ABCD$, seg AB $||$ seg DC, seg $BD \perp$ seg AD, seg $AC \perp$ seg BC, if $AD = 15$, $BC = 15$ and $AB = 25$. Find $A(\square ABCD)$.



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28. In the figure $2.35, \Delta PQR$ is an equilatral triangle. Point S is on seg QR such that $QS = \frac{1}{3}QR$. Prove that : $9PS^2 = 7PQ^2$

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29. Seg Pm is a median of `Delta PQR. If PQ = 40, PR = 42 and PM = 29, find QR.

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30. Seg AM is a median of ΔABC. If AB =22, AC =34, BC = 24, find AM.

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Challenging Questions

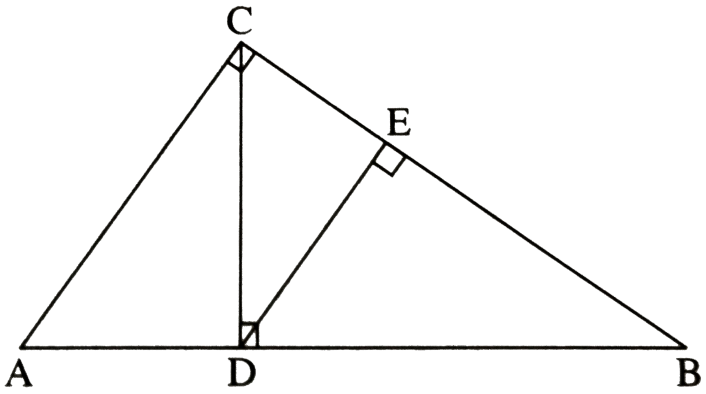
1. In $\triangle$ ABC ,

$\angle ACB = 90^\circ$,

$CD \perp AB$ and

$DE \perp CB$

Prove that $CD^2 \times AC = AD \times AB \times DE$.



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2. Using $8^2 - 7^2 = 15$, draw a square of area 15 sq cm

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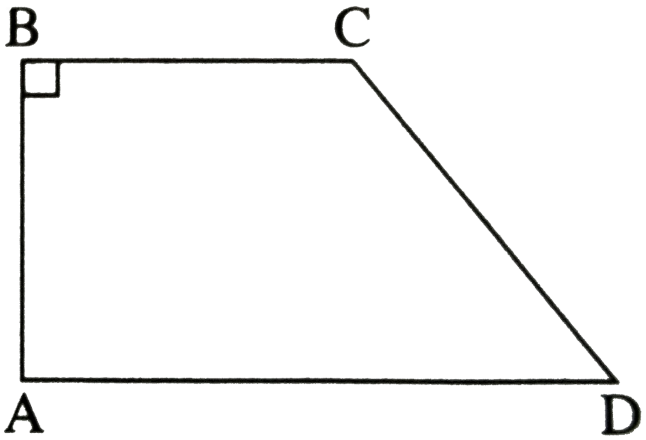
3. In the figure $\angle B = 90^\circ$,

$AD^2 = AB^2 + BC^2 + CD^2$.

Prove $\angle ACD = 90^\circ$.



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4. 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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5. ΔABC is an equilateral triangle. Point D is on side BC such that $BD = \frac{1}{5}BC$ then prove $25AD^2 = 21AB^2$.

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