

MATHS

BOOKS - CHETAN MATHS (TAMIL ENGLISH)

PYTHAGORAS THEOREM

Practice Set 21

1. In the adjoining figure, $\angle QPR = 90^{\circ}$, ${
m seg}PM \perp \,$ hypotenuse QR, Q -

M - R. If PM = 10, QM = 8 then find QR.



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



3. Length and breadth of a rectangle are 35 cm and 12 cm respectively. Find length of its diagonal.



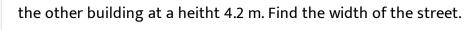


4. In the adjoining figure, $\angle DFE=90^\circ, FG\perp ED$ if GD=8, FG=12 then find (i) EG (ii) FD (iii) EF.





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







6. In adjoining figure, find RP and PS using the information given in ΔPSR find RP and PS.





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





8. Which of the following are pythagorean triplets justify. 3, 5, 4 **Watch Video Solution** 9. Which of the following are pythagorean triplets justify. 4,9,12 **Watch Video Solution** 10. Which of the following are pythagorean triplets justify. 5,12,13 **Watch Video Solution** 11. Which of the following are pythagorean triplets justify. 10,24,27



12. Which of the following are pythagorean triplets justify.

13. Which of the following are pythagorean triplets justify.

24,70,74



- 11,60,61
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Pratice Set 21

1. For finding AB and BC with the help of information in adjoining figure, complete the following activity,AB=BC........∴∠BAC=......∴AB=BC=......×AC

=.....×8 =.....×2×2 =.....

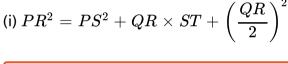
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Practice Set 2 2

1. In
$$\Delta PQR\mathrm{seg}PS$$
is median of ΔPQR . And $PT\perp QR$,

2. In $\Delta PQR \operatorname{seg} PS$ is median of ΔPQR . And $PT \perp QR$,





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$$(ii)PQ^2=PS^2-QR imes ST+\left(rac{QR}{2}
ight)^2$$



3. In adjoining figure, point T is in the interior of rectangle PQRS. Prove that, $TS^2 + TQ^2 = TP^2 + TR^2$



Pratice Set 2 2

1. In ΔPQR , Point S is the midpoint of side QR. If PQ = 11, PR = 17, PS = 13 then find QR.





2. In ΔABC ,point M is midpoint of side BC.

 $IfAB^2+AC^2=290cm^2=290cm^\circ$ and AM = 8 cm, find BC.





1. In ΔABC , AB=10, AC=7, BC=9 find the length of the median drawn from C to side . AB. Given

(i) In $\triangle ABC$, seg CM is a median(ii)AB=10, AC=7BC=9





Problem Set 2

- 1. Find the height of an equilateral triangle having side 2a.
- $(i)\Delta ABC$ is an equilateral triangle.

AB = 2a



- 2. Do sides 7cm, 24 cm, 25 cm from a right angled triangle? Give reason.
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3. Find the length a diagonal of a rectangle having side 11 cm and 60 cm.



4. Find the length of the hypotenuse of a right angled triangle if remaining sides are 9 cm and 12 cm.



5. A side of and isoceles right angled triangle is x. Find its hypotenuse..



6. In ΔPQR , $PQ=\sqrt{8}$, $QR=\sqrt{5}$, $PR=\sqrt{3}$ Is ΔPQR a right angle ? If yes which angle is of 90° ?



7. In ΔRST , $\angle S=90^{\circ}$, $\angle T=30^{\circ}$, RT = 12 cm. Find RS and ST.



8. Find the diagonal of a rectangle whose length is 16 cm and area is 192 sq. cm.

 \square ABCD is a rectangle (ii) AB = 16 cm (iii) $A(\ \square\ ABC) = 192sq.\ cm$





- **9.** Find the length of the side and perimeter of an equilateral triangle whose height is $\sqrt{3}cm$.
- $(i)\Delta ABC is an$ equilateral triangle.
- (ii) ${
 m seg}AM \perp sideBC, B-M-C$
- (iii) $AM=\sqrt{3}cm$



 ΔABC , segAP is a median. IfBC=18, $AB^2+AC^2=260$ find AP.



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11. ΔABC is an equilateral triangle. Point P is on base BC such that

$$PC = \frac{1}{3}BC$$
, if AB = 6 cm, find AP.

 ΔABC is an equilateral

(ii) AB = 6 cm

$$PC = \frac{1}{3}BC$$



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12. from the information given to the figure, Prove that : PM = PN = $\sqrt{3} \times a$





13. Prove that the sum of the squares of the squares of tha diagonals of a parallelogram is equal to tha sum of the squares of its sides.



14. Pranali and Prased started walking to the East and to the North respectively, from the same point and at the same speed. After 2 hours distance between them was $15\sqrt{2}$ km. Find their speed per hour.



15. In $\Delta ABC, \angle BAC=90^\circ, \; {\sf seg \; BL \; and \; seg \; CM \; are \; medians of } \Delta ABC$ prove that $4(BL^2+CM^2)=5BC^2$





16. Sum of squares of adjacent sides of a paralleogram is $130cm^2$ and length of one of its diagonal is 14 cm. Find length of the other diagonal.

- (i) $\square \, ABCD$ is a parallelogram
- $\mathsf{(ii)}AB^2 + BC^2 = 130cm^2$
- (iii) AC = 14 cm



17. In $\Delta ABC, {
m seg}AD \perp {
m seg}BC, DB = 3CD.$ Prove that:

$$2AB^2 = 2AC^2 + BC^2$$



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18. In an isosceles triangle, length of each congruent side is 13 cm and length of the base is 10 cm. Find the distance between vertex opposite to base and centroid.



19. In trapezium ABCD, seg AB \parallel seg DC. Seg $BD \perp$ seg AD, seg $AC \perp$ seg BC. If AD = 15, BC = 15 and AB = 25, then find $A(\Box ABCD)$





20. in the adjoining figure, ΔPQR is an equilateral triangle. Point S is on seg QR such that $QS=rac{1}{3}QR$, Prove that $9PS^2=7PQ^2$





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



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



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Problem Set 2 Mcq

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: C::D



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

A. 15

B. 13

C. 5

D. 12

Answer: A::C



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3. Out of the dates given below which date constitutes a pythagorean triplet?

A. 15/08/17

B. 16/08/16

 $\mathsf{C.}\,03/05/17$

Answer: A

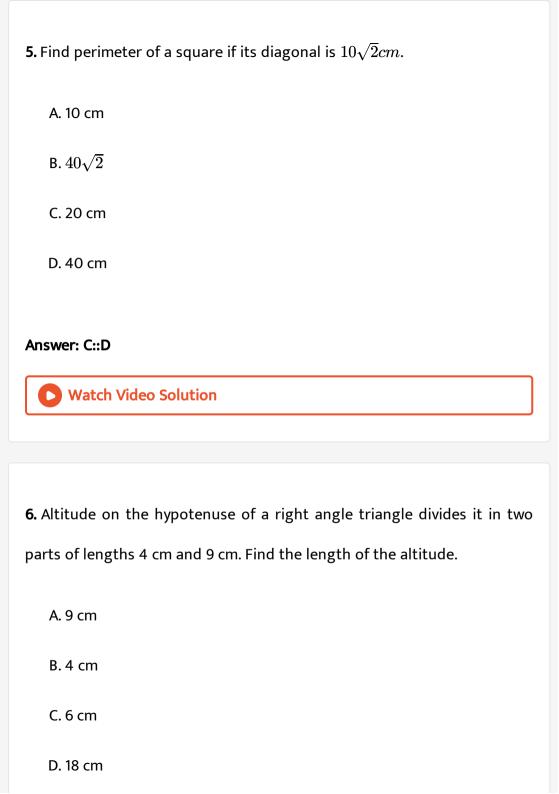


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- **4.** If a,b,c are sides of a triangle and $a^2+b^2=c^2$, name the type of triangle.
 - A. Obtuse angled triangle
 - B. Acute angled triangle
 - C. Right angled triangle
 - D. Equilateral triangle

Answer: A::D





Answer: C



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7. Height and base of a right angled triangle are 24 cm and 18 cm, find the length of its hypotenus.

- A. 24 cm
- B. 30 cm
- C. 15 cm
- D. 18 cm

Answer: C



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8.

In

 $\Delta ABCAB=6\sqrt{3}cm,\,AC=12cm,\,BC=6cm.$ Find measure of $\angle A$

A.
$$30^\circ$$

B. 60°

C. 90°

D. $45\,^\circ$

Answer: C



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Additional Mcq S

1. In $\Delta RST, \angle s = 90^{\circ}, RT = 12m, ST = 8$ m then RS=

A. $10\sqrt{8}m$

B. $5\sqrt{4}m$

 $\mathsf{C.}\,4\sqrt{5}m$

D. 5 m

Answer: D



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2. In $\Delta PQR, \angle PQR = 90^{\circ}, \, {
m seg}QM \perp hypPR, PM = 16 \, \, {
m and} \, \, RM = 9thenQM$

B. 25

C. 7

D. 16 imes 9

Answer: A::B



A. $3\sqrt{3}cm$

B. $4\sqrt{3}cm$

C. $12\sqrt{3}cm$

D. 12 cm

Answer: A::B::C



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- **4.** In $\Delta PQR, \angle Q=90^{\circ}, PQ=QR=5\sqrt{2}PR=10$ then $\angle P.....$
 - A. 30°
 - B. 45°

C. 60°

Answer: D

- D. Data not sufficient

5. Which of the following is a pythagorean triplet?

A. 60,61,11

B. 40,41,42

C. 11,12,15

D. 9,15,17

Answer: A



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6. In $\Delta QSR,\, m\angle Q=45^{\circ},\, m\angle S=90^{\circ}\,$ and $SR=4\mathrm{find}QS$

A. 3

B. 4

C. 5

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- **7.** Appollonius theorem is a theorem relating the length of Of a triangle.
 - A. Altitude
 - B. Angle bisector
 - C. Perpendicular bisector
 - D. Median and sides

Answer: A::D



8. In the adjoining figure, $AB^2+AC^2=122, BC=10, \,\, ext{then find AQ.....}$



A. 3

В. 6

C. 12

D. 36

Answer:



9. In $\Delta PQR,\, m \angle PQR = 90^{\circ}\,,\, segQS \perp hypPR$ then

A.
$$QS^2 = PS imes RS$$

B.
$$PS^2 = QS imes PR$$

C.
$$PR^2 = QS imes PS$$

D.
$$PR^2 = QS^2 imes PS^2$$

Answer: B



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10. In which of the following quadrilateral sum of squares of all sides is equal to the sum of squares of diagonals?

- A. Parallelogram
- B. Rhombus
- C. Square
- D. (A), (B) and (c)

Answer: A::B::C::D



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Problems For Practice

1.

 $\Delta XYZ, \angle y=90^{\circ}, \angle Z=a^{\circ}, \angle x=(a+30^{\circ}).\ If XZ=24 \mathrm{find} XY \mathrm{and} YZ$

In



2. In the adjoining figure, $\angle L=\angle MNK=90^\circ, \angle MKL=30^\circ \text{ and } \angle MNK=45^\circ. \ If KL=6\sqrt{3},$



3. Sides of triangles are given below. Determine which of the them are right angled triangle.(i) 8, 15, 17 (ii) 20,30,40

- (iii) 11,12,15 (iv) 20 ,16 ,12
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4. A ladder 10 m long reaches a window 8 m above the ground. Find the distance of the foot of the ladder from the base of the wall.



5. E is a point on hypotenuse dF of $\Delta DFH,$ such that seg

 $HE \perp segDF$, $segEG \perp segFH$ and $segEK \perp segDH$ prove that,

- (i) $EG^2 = FG \times EK$
- (ii) $EK^2 = DK \times EG$

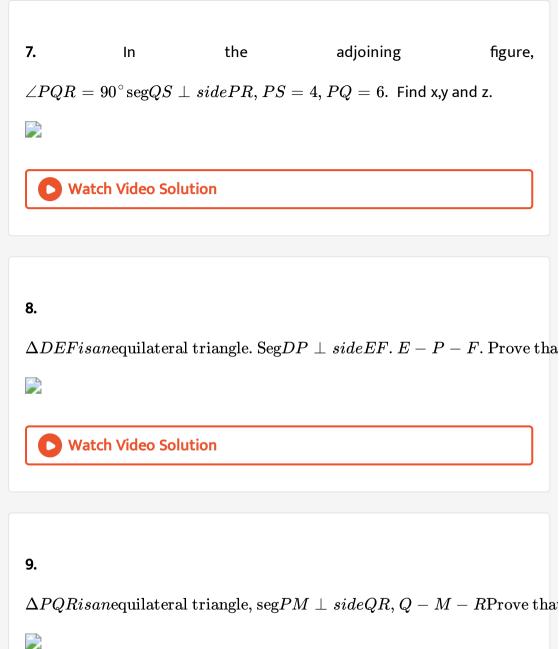


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6. In adjoining figure, seg AD bot side BC, B-D-C. Prove that

$$AB^2 + CD^2 = BD^2 + AC^2$$





 $BD \perp \mathrm{side}AC, C-D-A.$ Prove that : $AB^2 = BC^2 + AC^2 - BC.$ AC

 ΔPQR , Misthe midpoint of side QR. If PQ = 11, PR = 17 and QR = 12th

the

adjoining figure,

seg

In



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In

10.

11.





median on side BC.

13. In ΔABC , $AB^2+AC^2=122$ and BC=10 Find the length of the

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



15. If 'O' is any point in the interior of rectangle ABCD, then prove that :

$$OB^2 + OD^2 = OA^2 + OC^2$$



16. In the adjoining figure , ΔPQR is an equilateral triangle. QR = RN .

Prove that $PN^2 = 3PR^2$





17. In the adjoining figure, $\angle PQR = 90^{\circ}T$ is the midpoint of side QR.

in Δ PQR, angle PQR = 90^(a) "seg" QS bot "hypotenuse" PR, PS = 16, RS =

Prove that $PR^2=4PT^2-3PQ^2$





Assignment 2

1. Solve the following sub questions:

Is 28,21 and 35 a pythagorean triplet?



- 2. Solve the following sub questions:
- 9 "find" QS





3. Solve any one of the followng questions :

In $\triangle ADC$, $\angle ADC = 90^{\circ} \angle C = 45^{\circ}$, $AC = 8\sqrt{2}cm$. Find AD.





4.

In $\Delta XYZ, \angle y = 90^{\circ}, \angle Z = a^{\circ}, \angle X = (a+30)^{\circ} \mathrm{find} \angle x$



5. Solve the any one of following sub questions:

In

 $\Delta PQR, \mathrm{seg}PM$ is a median $PM=10 \,\,\mathrm{and}\,\,PQ^2+PR^2=328$ then findQR





6. Solve the any one of following sub questions:

If m and n are two distinct numbers then prove that $m^2-n^2, 2mn \text{ and } m^2+n^2$ is a pythagorean triplet.



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7. Solve the following sub question:

in the adjoining figure, seg

 $PSbatsideQR.\ IfPQ=a, PR=bQS=c\ \ {
m and}\ \ Rs=d\ \ {
m then}\ \ {
m complete}$

the following activity to prove that (a + b) (a - b) = (c + d) (c - d)

Proof : In $\Delta PSQ \angle PSQ = 90^\circ$

$$\Box^2 = PS^2 + \Box^2$$

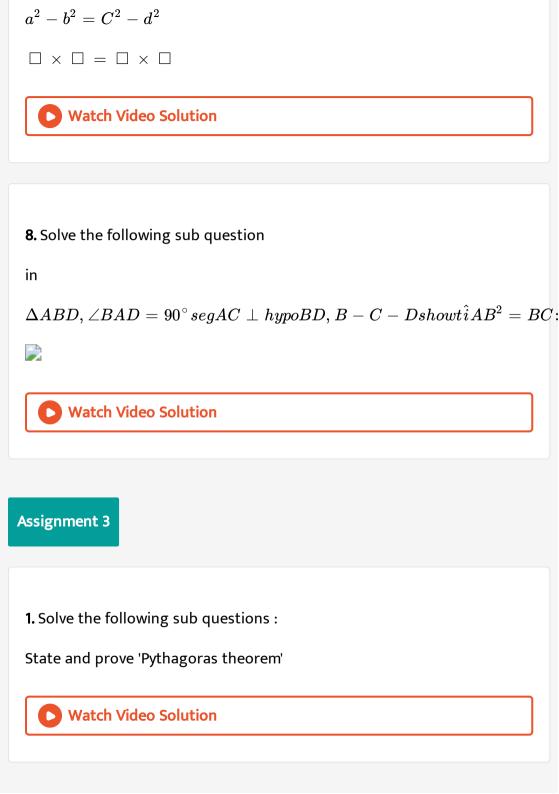
$$PS^2 = \square^2 - \square^2$$

In ΔPSR , $\angle PSR = 90^\circ$

$$\Box^2 = PS^2 + \Box^2$$

$$PS^2 = \Box^2 - \Box^2 = \Box^2 - \Box^2$$

$$a^2 - c^2 = b^2 - d^2$$



1. Solve the following sub questions:

In

 $DelatACB, \angle ACB = 90^{\circ} \operatorname{seg}CD \perp sideAB, A - D - B\operatorname{seg}DE \perp sideCB$





Assignment 5

1. Solve the following sub question:

In an equilateral triangle ABC, the side BC is trisected at D. prove that

 $9AD^2 = 7AB^2$

