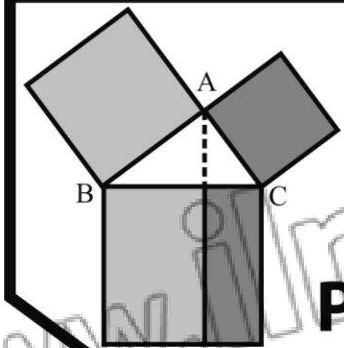


UNIT 15

PYTHAGORAS THEOREM

Work of Pythagoras on Right-Angled Triangles **(U.B + K.B)**

(LHR 2016, GRW 2014, 17, BWP 2017, SWL 2015, 16, 17, MTN 2015, D.G.K 2014, 15, 17)

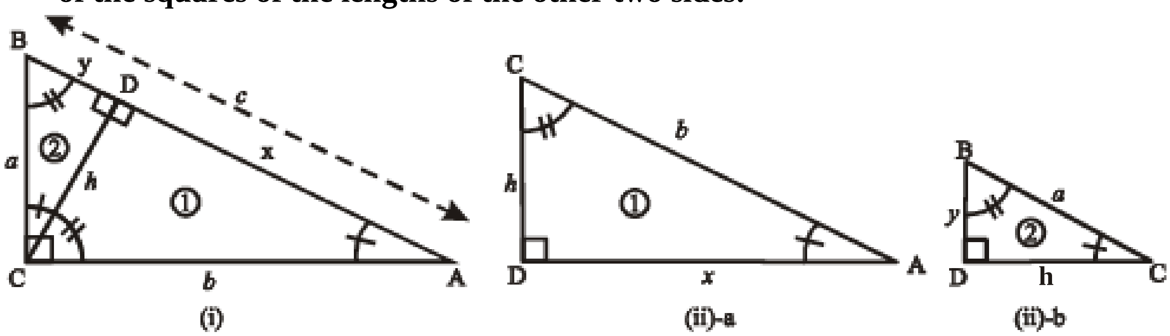
Pythagoras, a Greek philosopher and mathematician, discovered the simple but important relationship between the sides of a right-angled triangle. He formulated this relationship in the form of a theorem called Pythagoras' theorem after his name.

Note **(U.B + K.B)**

Birth of Pythagoras 580 BC – 572 BC
Death of Pythagoras 500 BC – 490 BC

Theorem 15.1.1 **(U.B + K.B)**

In a right angled triangle, the square of the length of hypotenuse is equal to the sum of the squares of the lengths of the other two sides.



Given

Δ ACB is a right angled triangle in which $m\angle C = 90°$ and $m\overline{BC} = a$, $m\overline{AC} = b$ and $m\overline{AB} = c$

To prove

$c^2 = a^2 + b^2$

Construction

Draw $\overline{CD}$ perpendicular from C on $\overline{AB}$

Let $m\overline{CD} = h$, $m\overline{AD} = x$ and $m\overline{BD} = y$. Line segment CD splits ΔABC into two Δs ADC and BDC which are separately shown in the figures (ii) –a and (ii) –b respectively.

Proof

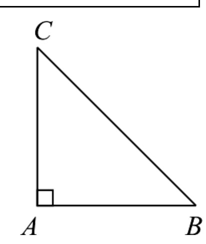
Statements	Reasons
In Δ ADC $\leftrightarrow$ Δ ACB	Refer to figure (ii)-a and (i)
$\angle A \cong \angle A$	Common – Self Congruent
$\angle ADC \cong \angle ACB$	Construction- given, each angle = 90°
$\angle C \cong \angle B$	$\angle C$ and $\angle B$ complements of $\angle A$
$\therefore \Delta ADC \sim \Delta ACB$	Congruency of three angles
$\therefore \frac{x}{b} = \frac{b}{c}$	(Measures of corresponding sides of similar triangles are proportional)
or $x = \frac{b^2}{c}$ ________ (i)	
Again in $\Delta BDC \leftrightarrow \Delta BCA$	Refer to figure (ii)-b and (i)
$\angle B \cong \angle B$	Common – self Congruent
$\angle BDC \cong \angle BCA$	Construction – given each angle = 90°
$\angle C \cong \angle A$	$\angle C$ and $\angle A$ complements of $\angle B$
$\therefore$ ΔBDC : ΔBCA	Congruency of three angles
$\therefore \frac{y}{a} = \frac{a}{c}$	(Corresponding sides of similar triangles are proportional)
or $y = \frac{a^2}{c}$ ________ (ii)	
But y + x = c	Supposition
$\therefore \frac{a^2}{c} + \frac{b^2}{c} = c$	By (i) and (ii)
or $a^2 + b^2 = c^2$	Multiplying both side by c
i.e. $c^2 = a^2 + b^2$	

Corollary: **(U.B + K.B)**

In a right angle ΔABC, the right angle at A.

(i) $m\overline{AB}^2 = m\overline{BC}^2 - m\overline{CA}^2$

(ii) $m\overline{AC}^2 = m\overline{BC}^2 - m\overline{AB}^2$

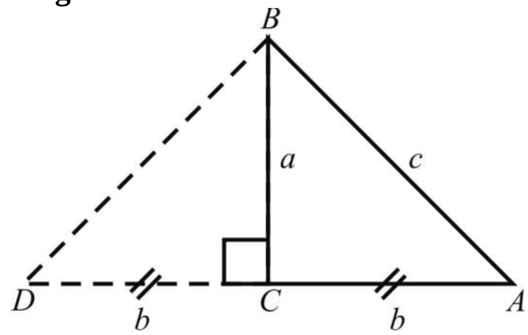


Note **(U.B + K.B)**

Pythagoras' theorem has many proofs. The one we have given is based on the proportionality of the sides of two similar triangles. For convenience $\Delta s\ ADC$ and CDB have been shown separately. Otherwise, the theorem is usually proved using figure (i) only.

Theorem 15.1.2 Converse of Pythagoras Theorem 15.1.1 **(U.B + K.B)**

If the Square of one side of a triangle is equal to the sum of the square of the other two sides, then the triangle is a right angled triangle.



Given

In a ΔABC, $m\overline{AB} = c, m\overline{BC} = a, m\overline{AC} = b$

Such that $a^2 + b^2 = c^2$.

To prove

ΔACB is a right angled triangle.

Construction

Draw $\overline{CD}$ perpendicular to $\overline{BC}$ Such that $\overline{CD} \cong \overline{CA}$. Join the points B and D.

Proof

Statements	Reasons
ΔDCB is a right angled triangle.	Construction
$\therefore \left(m\overline{BD}\right)^2 = a^2 + b^2$	Pythagoras theorem
But $a^2 + b^2 = c^2$	Given
$\therefore \left(m\overline{BD}\right)^2 = c^2$	
or $m\overline{BD} = c$	Taking Square root on both sides
Now in $\Delta DCB \leftrightarrow \Delta ACB$	
$\overline{CD} \cong \overline{CA}$	Construction
$\overline{BC} \cong \overline{BC}$	Common
$\overline{DB} \cong \overline{AB}$	Each side = c
$\therefore \Delta\ DCB \cong \Delta\ ACB$	S.S.S ≅ S.S.S
$\therefore \angle\ DCB \cong \angle ACB$	Corresponding angles of congruent triangles
But $m\angle\ DCB = 90°$	Construction
$\therefore m\angle\ ACB = 90°$	
Hence the Δ ACB is a Right angled triangle.	

Corollary **(U.B + K.B + A.P)**

Let c be the longest of the sides a, b and c of a triangle.

If $a^2 + b^2 = c^2$, then the triangle is right.

If sum of the squares of two sides is equal to third side, then triangle is right angled triangle.

If $a^2 + b^2 > c^2$, then the triangle is acute.

If sum of the squares of two sides is greater than the third side, the triangle is acute angled triangle.

If $a^2 + b^2 < c^2$, then the triangle is obtuse.

If sum of the squares of two sides is smaller than the third side, the triangle is obtuse angled triangle.

Exercise 15

Q.1 Verify that the Δs having the following measures of sides are right-angled. (A.B)

Solution:

Δs are right angled, if (U.B)

(Hypotenuse)^2 = (base)^2 + (Perpendicular)^2

(i) **(LHR 2016, GRW 2013, FSD 2015, 17, MTN 2013, SWL 2014, 15, 17, SGD 2013, 17)**

a = 5cm $\Rightarrow$ $a^2 = 25cm^2$
b = 12cm $\Rightarrow$ $b^2 = 144cm^2$
c = 13cm $\Rightarrow$ $c^2 = 169cm^2$

Larger Size is Hypotenuse, So

$c^2 = a^2 + b^2$

Putting the values

169 = 25 + 144

169 = 169

Satisfied

So, given measures form a right angled triangle.

(ii) **(GRW 2016, FSD 2017, MTN 2013, 16, SWL 2015, SGD 2017)**

a = 1.5cm $\Rightarrow$ $a^2 = 2.25cm^2$
b = 2cm $\Rightarrow$ $b^2 = 4cm^2$
c = 2.5cm $\Rightarrow$ $c^2 = 6.25\ cm^2$

Larger Size is Hypotenuse, So

$c^2 = a^2 + b^2$

Putting the values **(U.B)**

6.25 = 2.25 + 4

6.25 = 6.25

Satisfied

So, given measures form a right angled triangle.

(iii) **(LHR 2013, 14, 15, 16, GRW 2015, FSD 2014, SWL 2017, SGD 2015, RWP 2017)**

a = 9cm $\Rightarrow$ $a^2 = 81cm^2$
b = 12cm $\Rightarrow$ $b^2 = 144cm^2$
c = 15cm $\Rightarrow$ $c^2 = 225cm^2$

Larger Size is Hypotenuse, So

$c^2 = a^2 + b^2$

Putting the values **(U.B)**

$225cm^2$ = 8.1cm + 144cm

$225cm^2 = 225cm^2$

Satisfied.

So, given measures form a right angled triangle.

(iv) a = 16cm $a^2 = 256cm^2$
b = 30cm $b^2 = 900cm^2$
c = 34cm $c^2 = 1156cm^2$

Larger Size is Hypotenuse, So

$c^2 = a^2 + b^2$

Putting the values

1156 = 256 + 900

1156 = 1156 **(A.B)**

Satisfied

So, given measures form a right angled triangle.

Q.2 Verify that a^2+b^2, a^2-b^2 and 2ab are the measures of the sides of a right angled triangle where a and b are any two real numbers (a >b). **(LHR 2017) (U.B + A.B)**

Solution:

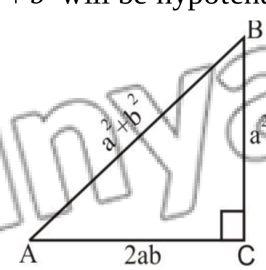
Let $a = 2$ and $b = 1$

$a^2 + b^2 = (2)^2 + (1)^2 = 4 + 1 = 5$

$a^2 - b^2 = (2)^2 - (1)^2 = 4 - 1 = 3$

$2ab = 2(2)(1) = 4$

Since a^2+b^2 is the largest side so a^2+b^2 will be hypotenuse.



So

Triangle is right angled, if

$(a^2+b^2)^2 = (2ab)^2 + (a^2-b^2)^2$

$a^4 + b^4 + 2a^2b^2 = 4a^2b^2 + a^4 + b^4 - 2a^2b^2$

$a^4 + b^4 + 2a^2b^2 = a^4 + b^4 + 2a^2b^2$

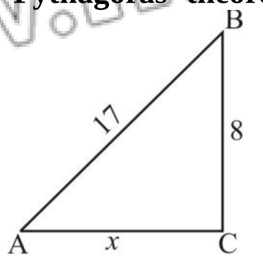
L.H.S = R.H.S

It is proved that it is a right angled triangle

Q.3 The three sides of a triangle are of measure 8, x and 17 respectively. For what value of x will it become base of right angled triangle? **(U.B + A.B)**

Solution:

By **Pythagoras' theorem**



$$\left(\overline{AB}\right)^2 = \left(\overline{AC}\right)^2 + \left(\overline{BC}\right)^2$$

$$(17)^2 = (x)^2 + (8)^2$$

$$289 = x^2 + 64$$

$$289 - 64 = x^2$$

$$x^2 = 225$$

Taking square root on both sides

$$\sqrt{x^2} = \sqrt{225}$$

$x = 15$ (as length is always positive)

$\therefore$ base = 15 units

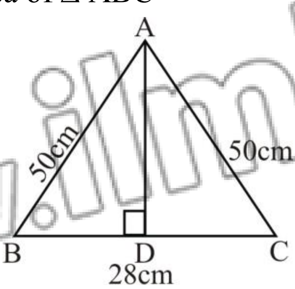
Q.4 In an isosceles Δ, the base $m\overline{BC} = 28\text{cm}$ **and** **(A.B)**

$m\overline{AB} = m\overline{AC} = 50\text{cm}$

If $\overline{AD} \perp \overline{BC}$**, then find**

(i) Length of $\overline{AD}$

(ii) Area of Δ ABC



Solution:

(i) Length of $\overline{AD}$

$\overline{AD} \perp \overline{BC}$

So $m\overline{BD} = m\overline{CD}$

$$\frac{1}{2}\overline{BC} = \frac{1}{2}(28)$$

$$\frac{1}{2}\overline{BC} = 14$$

So

$$\overline{BD} = \overline{CD} = 14$$

$$\left(\overline{AB}\right)^2 = \left(\overline{BD}\right)^2 + \left(\overline{AD}\right)^2$$

$$2500 = (14)^2 + \left(\overline{AD}\right)^2$$

$$2500 = 196 + \left(\overline{AD}\right)^2$$

$$2500 - 196 = \left(\overline{AD}\right)^2$$

$$\left(\overline{AD}\right)^2 = 2304$$

Taking square root on both sides

$$\sqrt{\left(\overline{AD}\right)^2} = \sqrt{2304}$$

$$\overline{AD} = 48\text{cm}$$

(i) Area of Δ ABC

Area of Δ ABC $= \frac{1}{2}$ (base)× (height)

$= \frac{1}{2}$ (28) × (48)

= (14) × (48)

= 672 cm^2

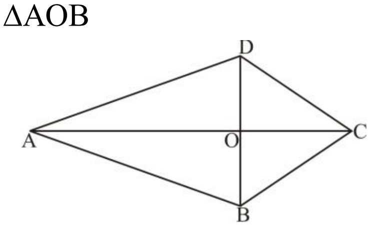
Q.5 In a quadrilateral ABCD, the diagonals $\overline{AC}$ and $\overline{BD}$ are perpendicular to each other.

Prove that: **(A.B)**

$$\left(\overline{AB}\right)^2 + \left(\overline{CD}\right)^2 = \left(\overline{AD}\right)^2 + \left(\overline{BC}\right)^2$$

Proof

ΔAOB



$\left(\overline{AB}\right)^2 = \left(\overline{OB}\right)^2 + \left(\overline{OA}\right)^2 \longrightarrow$ (i)

ΔBOC

$\left(\overline{BC}\right)^2 = \left(\overline{OB}\right)^2 + \left(\overline{OC}\right)^2 \longrightarrow$ (ii)

ΔCOD

$\left(\overline{CD}\right)^2 = \left(\overline{OD}\right)^2 + \left(\overline{OC}\right)^2 \longrightarrow$ (iii)

ΔDOA

$\left(\overline{AD}\right)^2 = \left(\overline{OA}\right)^2 + \left(\overline{OD}\right)^2 \longrightarrow$ (iv)

By adding (i) and (iii)

$\left(\overline{AB}\right)^2 + \left(\overline{CD}\right)^2 = \left(\overline{OB}\right)^2 + \left(\overline{OA}\right)^2 + \left(\overline{OD}\right)^2 + \left(\overline{OC}\right)^2 \rightarrow (v)$

By adding (ii) and (iv)

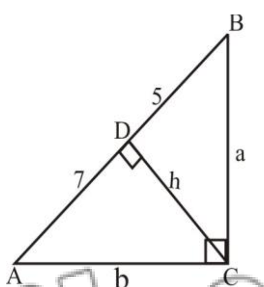
$\left(\overline{AD}\right)^2 + \left(\overline{BC}\right)^2 = \left(\overline{OB}\right)^2 + \left(\overline{OC}\right)^2 + \left(\overline{OA}\right)^2 + \left(\overline{OD}\right)^2 \rightarrow (vi)$

By comparing (v) and (vi)

$\left(\overline{AB}\right)^2 + \left(\overline{CD}\right)^2 = \left(\overline{AD}\right)^2 + \left(\overline{BC}\right)^2$

Hence proved

Q.6 In the ΔABC as shown in the figure, m$\angle$ACB=90° and $\overline{CD} \perp \overline{AB}$. Find the length a, h and b if $m\overline{BD} = 5$ units and $m\overline{AD} = 7$ units. (A.B)



ΔACB

$(7+5)^2 = (b)^2 + (a)^2$

$a^2 + b^2 = (12)^2$

$a^2 + b^2 = 144$ ______ (i)

ΔADC

$(b)^2 = (7)^2 + (h)^2$

$b^2 - h^2 = 49$________ (ii)

ΔCDB

$a^2 = (5)^2 + (h)^2$

$a^2 - h^2 = 25$_______ (iii)

Subtracting ii from iii

$a^2 - \cancel{h^2} = 25$

$\pm b^2 \mp \cancel{h^2} = \pm 49$

$a^2 - b^2 = -24$

$a^2 - b^2 = -24$ _________ (iv)

Adding equation (i) and (iv)

$a^2 + \cancel{b^2} = 144$

$a^2 - \cancel{b^2} = -24$

$2a^2 = 120$

$a^2 = \frac{\cancel{120}^{60}}{\cancel{2}}$

$a^2 = 60$

$a^2 = 4 \times 15$

Taking square root on both sides

$\sqrt{a^2} = \sqrt{4 \times 15}$

$a = 2\sqrt{15}$

Putting the value of a in equation (i)

$\left(2\sqrt{15}\right)^2 + b^2 = 144$

$4 \times 15 + b^2 = 144$

$60 + b^2 = 144$

$b^2 = 144 - 60$

$b^2 = 84$

$b^2 = 4 \times 21$

Taking square root on both sides

$b^2 = \sqrt{4 \times 21}$

$b = 2\sqrt{21}$

Putting the value of b in equation (ii)

$\left(2\sqrt{21}\right)^2 - h^2 = 49$

$4 \times 21 - 49 = h^2$

$h^2 = 84 - 49$

$h^2 = 35$

Taking square root on both sides

$h = \sqrt{35}$

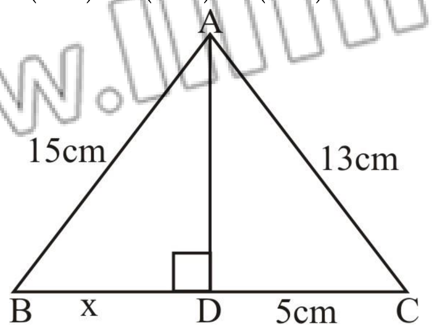
Result:

$a = 2\sqrt{15}$, $b = 2\sqrt{21}$ and $h = \sqrt{35}$

(i) Find the value of x in the shown figure. (A.B)

From ΔADC

$$\left(\overline{AC}\right)^2 = \left(\overline{DC}\right)^2 + \left(\overline{AD}\right)^2$$



In right triangle ADC,

$$\left(\overline{AC}\right)^2 = \left(\overline{DC}\right)^2 + \left(\overline{AD}\right)^2$$

$$(13)^2 = (5)^2 + \left(\overline{AD}\right)^2$$

$$169 = 25 + \left(\overline{AD}\right)^2$$

$$169 - 25 = \left(\overline{AD}\right)^2$$

$$\left(\overline{AD}\right)^2 = 144$$

Taking square root both side

$$\sqrt{\left(\overline{AD}\right)^2} = \sqrt{(144)}$$

$$\overline{AD} = 12\text{ cm}$$

From Δ ADB

$$\left(\overline{AB}\right)^2 = (BD)^2 + \left(\overline{AD}\right)^2$$

$$(15)^2 = x^2 + (12)^2$$

$$225 = x^2 + 144$$

$$225 - 144 = x^2$$

$$x^2 = 81$$

Taking square on both sides

$$\sqrt{x^2} = \sqrt{81}$$

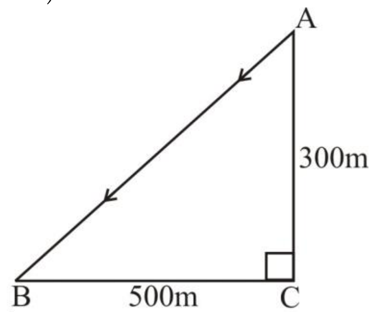
$$x = 9\text{ cm}$$

Q.7 A plane is at a height of 300m and is 500m away from the airport as shown in the figure How much distance will it travel to land at the airport? (A.B)

ΔABC is right angle triangle

$$\left(\overline{AB}\right)^2 = \left(\overline{BC}\right)^2 + \left(\overline{AC}\right)^2$$

$$\left(\overline{AB}\right)^2 = (500)^2 + (300)^2$$



$$\left(\overline{AB}\right)^2 = 250000 + 90000$$

$$\left(\overline{AB}\right)^2 = 340000$$

$$\left(\overline{AB}\right)^2 = 10000 \times 34$$

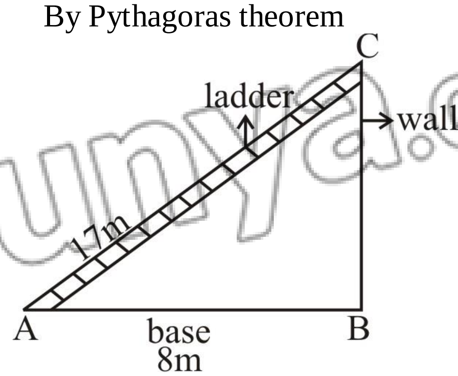
Taking square root on both sides

$$\sqrt{\left(\overline{AB}\right)^2} = \sqrt{10000 \times 34}$$

$$m\overline{AB} = 100\sqrt{34}\, m$$

Q.8 A ladder 17m long rests against a vertical wall. The foot of the ladder is 8m away from the base of the wall. How high up the wall will the ladder reach? (SWL 2014) (A.B)

By Pythagoras theorem



$$\left(\overline{AC}\right)^2 = \left(\overline{AB}\right)^2 + \left(\overline{BC}\right)^2$$

$$(17)^2 = (8)^2 + \left(\overline{BC}\right)^2$$

$$289 = 64 + \left(\overline{BC}\right)^2$$

$$284 - 64 = \left(\overline{BC}\right)^2$$

$\left(\overline{BC}\right)^2 = 225$

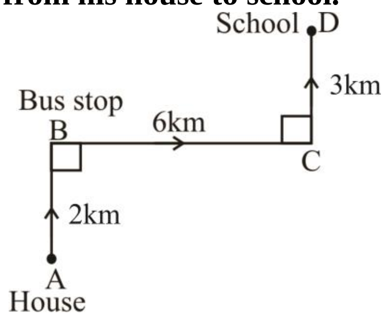
Taking square root on both sides

$\sqrt{\left(\overline{BC}\right)^2} = \sqrt{225}$

$\overline{BC} = 15\text{m}$

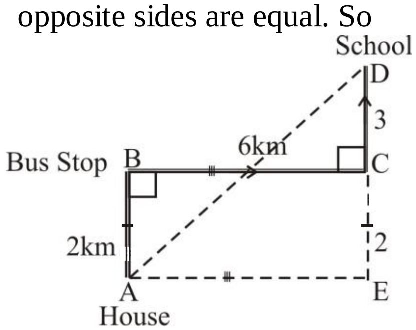
The height of wall $= \overline{BC} = 15m$

Q.9 A student travels to his school by the route as shown in the figure. Find $m\overline{AD}$, the direct distance from his house to school. (A.B)



Solution:

As we know that in rectangle opposite sides are equal. So



$\overline{AB} = \overline{CE} = 2km$

$\overline{BC} = \overline{AE} = 6km$

$\overline{DE} = \overline{DC} + \overline{CE}$

$\therefore$ We get triangle

Δ ADE which is right angled triangle

$\left(\overline{AD}\right)^2 = \left(\overline{AE}\right)^2 + \left(\overline{ED}\right)^2$

$\left(\overline{AD}\right)^2 = (6)^2 + (3+2)^2$

$\left(\overline{AD}\right)^2 = 36 + (5)^2$

$\left(\overline{AD}\right)^2 = 36 + 25$

$\left(\overline{AD}\right)^2 = 61$

Taking square root on both sides

$\sqrt{\left(\overline{AD}\right)^2} = \sqrt{61}$

$m\overline{AD} = \sqrt{61}\,km$

Therefore, Distance between school and home is $\sqrt{61}\,km$.

Review Exercise 15

Q.1 Which of the following are true and which are false? (A.B + U.B + K.B)

(i) In a right angled triangle greater angle is of 90°. (True)

(ii) In a right angled triangle right angle is of 60°. (False)

(iii) In a right triangle hypotenuse is a side opposite to right angle. (True)

(iv) If a,b,c are sides of right angled triangle with c as longer side, then c $c^2 = a^2 + b^2$. (True)

(v) If 3cm and 4cm are two sides of a right angled triangle, the hypotenuse is 5cm. (True)

(vi) If hypotenuse of an isosceles right triangle is $\sqrt{2}$ cm then each of other side is of length 2cm. (False)

Q.2 Find the unknown value in each of the following figures. (A.B)

(i) **(LHR 2016, 17, SWL 2016, BWP 2016, 17, RWP 2017, D.G.K 2014, 16)**

By Pythagoras' theorem

$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Perpendicular})^2$

$(x)^2 = (3)^2 + (4)^2$

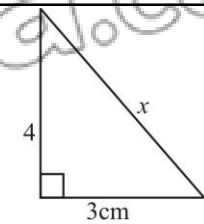
$x^2 = 9 + 16$

$x^2 = 25$

Taking square root on both sides

$\sqrt{x^2} = \sqrt{25}$

$x = 5cm$



(ii) **(LHR 2017, GRW 2013, 16, SWL 2017, FSD 2015, 17, MTN 2016, D.G.K 2013)**

By Pythagoras theorem **(A.B)**

$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Perpendicular})^2$

$(10)^2 = (x)^2 + (6)^2$

$100 = x^2 + 36$

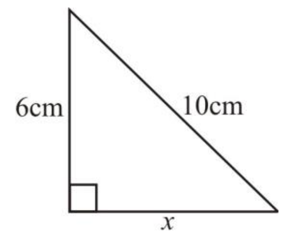
$100 - 36 = x^2$

$x^2 = 64$

Taking square root on both sides

$\sqrt{x^2} = \sqrt{64}$

$x = 8cm$



(iii) **(FSD 2017, RWP 2017, SWL 2015, D.G.K 2016)**

By Pythagoras theorem **(A.B)**

$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Perpendicular})^2$

$(13)^2 = (5)^2 + (x)^2$

$169 = 25 + x^2$

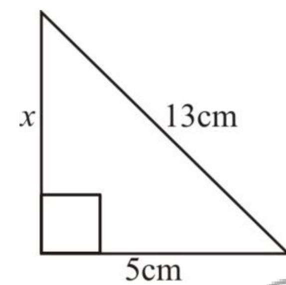
$169 - 25 = x^2$

$x^2 = 144$

Taking square root on both sides

$\sqrt{x^2} = \sqrt{144}$

$x = 12\,cm$



(iv) **(RWP 2016, D.G.K 2015)**

By Pythagoras theorem **(A.B)**

$(\text{Hypotenuse})^2 = (\text{base})^2 + (\text{Perpendicular})^2$

$\left(\sqrt{2}\right)^2 = (1)^2 + (x)^2$

$2 = 1 + x^2$

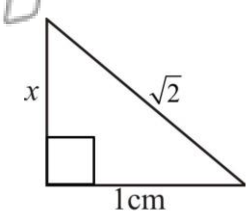
$2 - 1 = x^2$

$x^2 = 1$

Taking square root on both sides

$\sqrt{x^2} = \sqrt{1}$

$x = 1cm$



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SELF TEST

Time: 40 min **Marks: 25**

Q.1 Mark the Correct multiple choice question. **(7×1=7)**

1 Which of the following is trichotomy property of real number:

(A) $m\overline{AB} = m\overline{BC}$ **(B)** $m\overline{AB} > m\overline{BC}$

(C) $m\overline{AB} < m\overline{BC}$ **(D)** None of these

2 Which of following set of lengths can be the lengths of the sides of a triangle.

(A) 2 cm, 3 cm, 5 cm **(B)** 3 cm, 4 cm, 5 cm

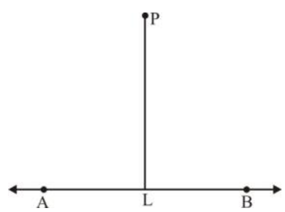
(C) 2 cm, 4 cm, 7 cm **(D)** 4 cm, 3 cm, 7 cm

3 Two sides of a triangle measure 10 cm and 15 cm. which of the following measure is possible for the third side

(A) 5 cm **(B)** 20 cm

(C) 25 cm **(D)** 30 cm

4 In the figure, P is any point lying away from the line AB. Then $m\overline{PL}$ will be shortest distance if



(A) $m\angle PLA = 80^o$ **(B)** $m\angle PLB = 100^o$

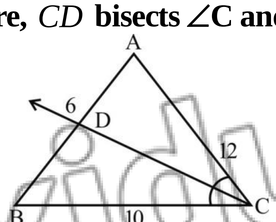
(C) $m\angle PLA = 90^o$ **(D)** $m\angle PLA = 70^o$

5 If a line segment intersects the two sides of a triangle in the same ratio then it is ___________ to the third side

(A) Perpendicular **(B)** Parallel

(C) Intersecting **(D)** Similar

6 In ΔABC as shown in the figure, $\overline{CD}$ bisects $\angle$C and meets $\overline{AB}$ at D. $m\overline{BD}$ is equal to:



(A) 5 **(B)** 16

(C) 10 **(D)** 18

7 If $a^2 + b^2 > c^2$ then triangle is called

(A) Acute **(B)** Obtuse

(C) Scalene **(D)** Right

8 In a right angled triangle the greatest angle is of

(A) 60^o **(B)** 90^o

(C) 120^o **(D)** 180^o

9 If hypotenuse of an isosceles right triangles is 12 cm then each of other side is of length

(A) 2 **(B)** 4

(C) 1 **(D)** $6\sqrt{2}$

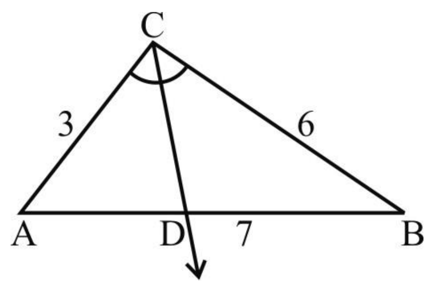
Q.2 Give Short Answers to following Questions. **(5×2=10)**

(i) If 13 cm, 12 cm, and 5 cm are the lengths of a triangle, then verify that difference of measure of any two sides of a triangle is less then measure of the third side.

(ii) In a triangle ABC, $m\angle B = 70^\circ$ and $m\angle C = 45^\circ$, which of the sides of the triangle is longest and which is the shortest?

(iii) The three sides of a triangle are of measure 8, x, and 17 respectively for what value of x will it become base of a right angled triangle?

(iv) In ΔABC shown in the figure, $\overrightarrow{CD}$ bisects $\angle C$. If $m\overline{AC} = 3$, $m\overline{CB} = 6$ and $m\overline{AB} = 7$, then find $m\overline{AD}$ and $m\overline{DB}$

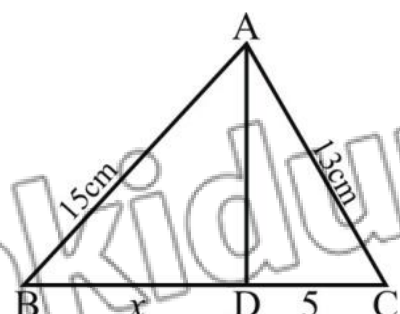


(v) Find the value of x in the shown figure

If AD = 2.4 cm, $\overline{AE} = 3.2\,\text{cm}$, $\overline{DE} = 2$ cm, BC = 5 cm find $\overline{AB}$, $\overline{DB}$, $\overline{AC}$, $\overline{CE}$.

Q.3 Answer the following Questions. **(4+4=8)**

(a) Define similar triangles.



(b) A ladder 17m long rests against a vertical wall. The foot of the ladder is 8m away from the base of the wall. How high up the wall will the ladder reach?

Note:

Parents or guardians can conduct this test in their supervision in order to check the skills of the student.