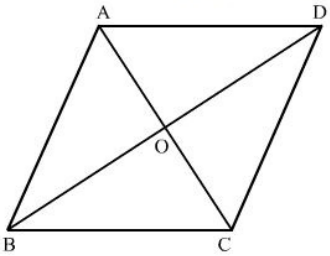
Triangles Ex 4.7 Q14

Answer :

We know that a quadrilateral is said to a rhombus if all sides of the quadrilateral are equal. Diagonals of a rhombus bisect each other at right angles.
Quadrilateral ABCD is a rhombus and diagonals AC and BD intersect at point O.



As we defined above, we get $AB = BC = CD = AD$, $AO = OC$, $BO = OD$ and angle $\angle AOD = \angle AOB = \angle BOC = \angle COD = 90°$.
We are given that AC = 10 cm and BD = 24 cm.
Therefore, we get, AO = OC = 5 cm and BO = OD = 12 cm.
Now we will use Pythagoras theorem in the right angled triangle AOD as below,

$AD^2 = AO^2 + OD^2$ .....(1)

Now we will substitute the values of AO and OD in equation (1) we get,

$AD^2 = 5^2 + 12^2$

$AD^2 = 25 + 144$

$AD^2 = 169$

Let us take the square root

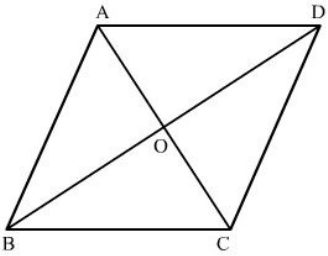
AD = 13

Therefore, length of the side of the rhombus is $\boxed{13\text{cm}}$.

Triangles Ex 4.7 Q15

Answer :

We know that a quadrilateral is said to a rhombus if all sides of the quadrilateral are equal. Diagonals of a rhombus bisect each other at right angles.
Quadrilateral ABCD is a rhombus and diagonals AC and BD intersect at point O.



As we defined above, we get $AB = BC = CD = AD$, $AO = OC$, $BO = OD$ and angle $\angle AOD = \angle AOB = \angle BOC = \angle COD = 90^0$.
We are given that AB = 10 cm and AC = 16 cm. Now we will find length of BD.
As we know the definition of rhombus we get AB = BC = CD = AD.
Therefore, we get, AB = BC = CD = AD = 10 cm

Also we know that diagonals of rhombus bisect each other at right angles therefore, we get,

$\mathrm{AO} = \mathrm{OC}$,

$\mathrm{BO} = \mathrm{OD}$

and $\angle \mathrm{AOD} = \angle \mathrm{AOB} = \angle BOC = \angle COD = 90^0$

Here, we know the length of AC therefore, we get, $\mathrm{AO} = \mathrm{OC} = 8\ \mathrm{cm}$.

Now we will use Pythagoras theorem in the right angled triangle AOD as below,

$\mathrm{AD}^2 = \mathrm{AO}^2 + \mathrm{OD}^2$ .....(1)

Now we will substitute the values of AD and AO in equation (1) we get,

$10^2 = 8^2 + OD^2$

$100 = 64 + OD^2$ .....(2)

Now we will subtract 64 from both sides of the equation (2)

$OD^2 = 100 - 64$

$OD^2 = 36$

Now we will take the square root.

OD = 6

We know that $BD = 2OD$

$\therefore BD = 2 \times 6$

$\therefore BD = 12$

Therefore, length of the other diagonal is $\boxed{12\ \mathrm{cm}}$.

********** END **********