

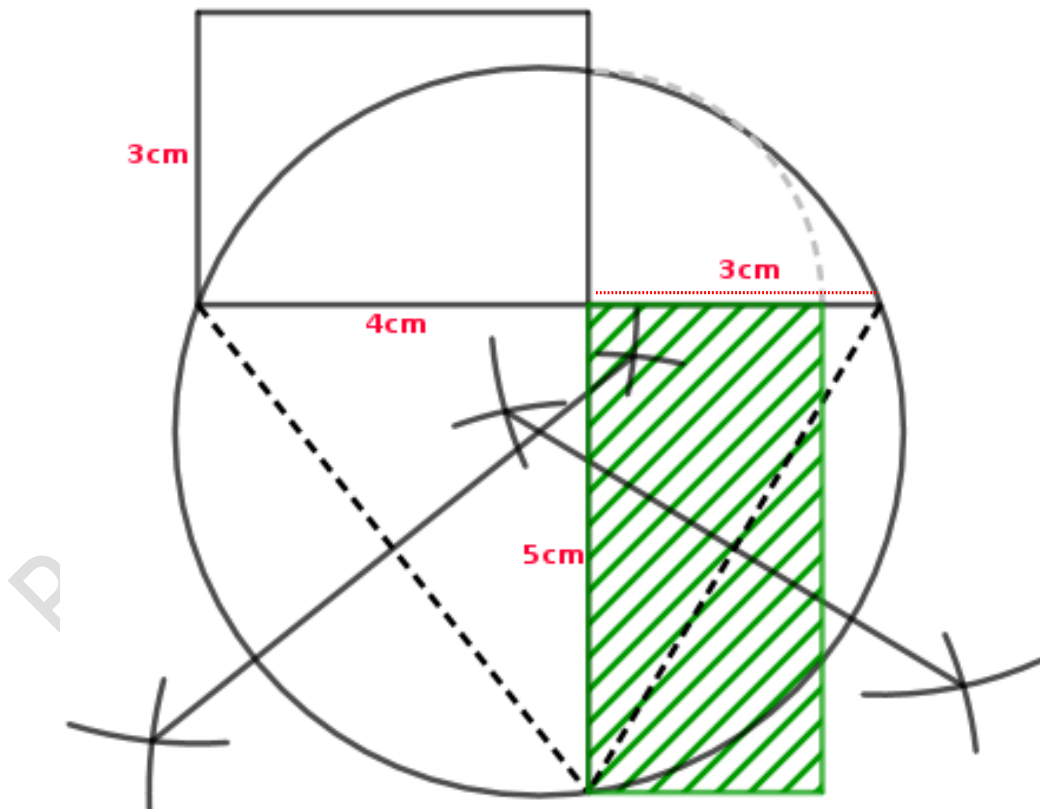
Online Class - X - 25

17 / 08 / 2021

## 2 . Circles - Class 13

To view class Assignment Answer

- Q) Draw a rectangle of length 4 centimetres and width 3 centimetres.  
Draw another rectangle of the same area with one side 5 centimetres.**

**Ans)**

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**Finding the relation between parts of two intersecting chords – when one chord is a diameter and other chord is perpendicular to the diameter**

In the picture given,

**AB is a diameter and CD is a chord perpendicular to AB.**

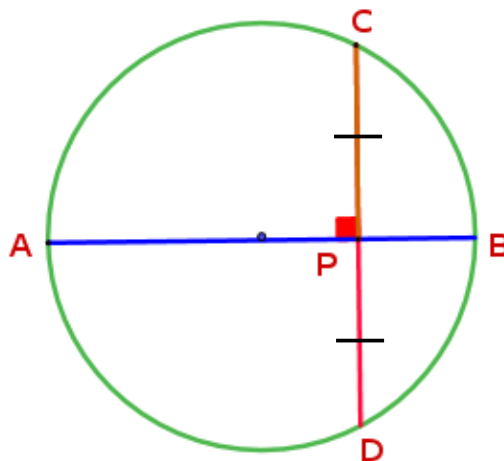
Since the chords AB & CD intersect at P.

$$PA \times PB = PC \times PD \dots\dots (1)$$

We know, the perpendicular drawn from the centre of a circle bisects the chord.

So AP bisects CD

$$\therefore PC = PD$$



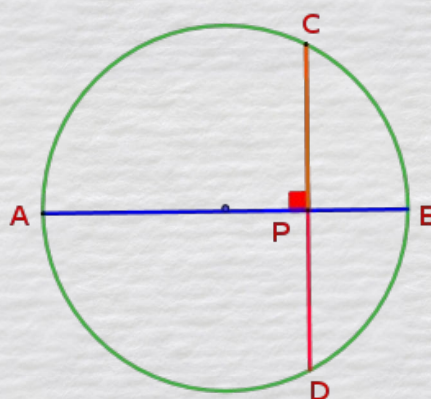
Substituting in (1) we have,

$$PA \times PB = PC \times PC$$

$$PA \times PB = PC^2$$

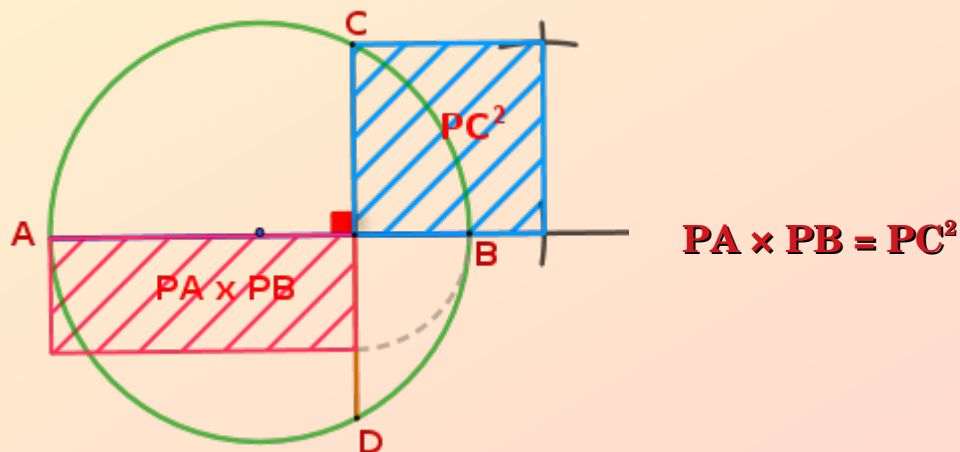
The product of the parts into which a diameter of a circle is cut by a perpendicular chord, is equal to the square of half the chord.

$$PA \times PB = PC^2$$

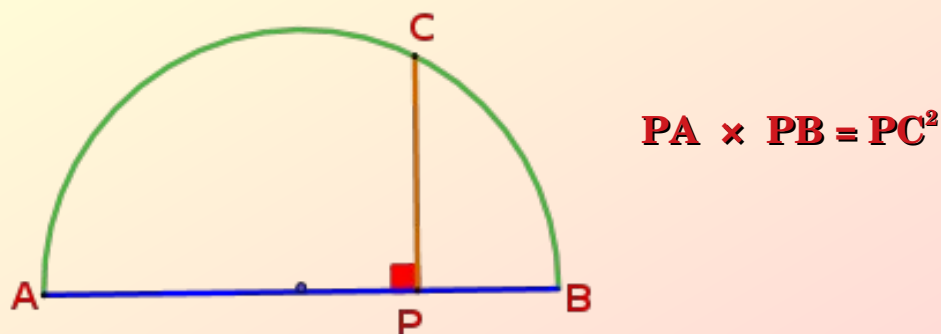


The relation  $PA \times PB = PC^2$  can be put in geometric language as below:

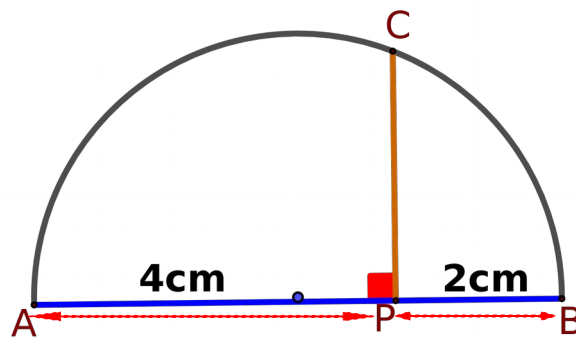
The area of the rectangle formed of parts into which a diameter of a circle is cut by a perpendicular chord is equal to the area of the square formed by half the chord.



Since  $AB$  is the diameter, by considering the semi circle we can observe above relation as,



**Q1) In the picture PA = 4cm, PB = 2cm, find PC ?**



**Ans) Given PA = 4cm, PB = 2cm**

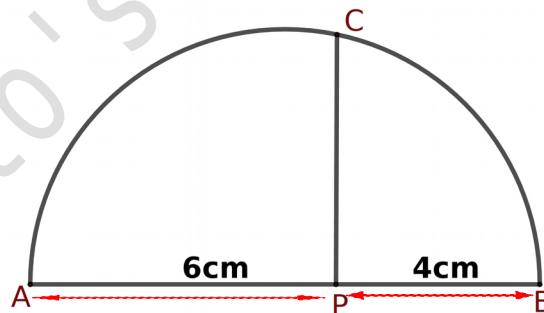
$$PA \times PB = PC^2$$

$$4 \times 2 = PC^2$$

$$PC^2 = 8$$

$$\therefore PC = \sqrt{8} \text{ cm}$$

**Q2) In the picture PA = 6cm, PB = 4cm, find PC ?**



**Ans) Given PA = 6 cm, PB = 4 cm**

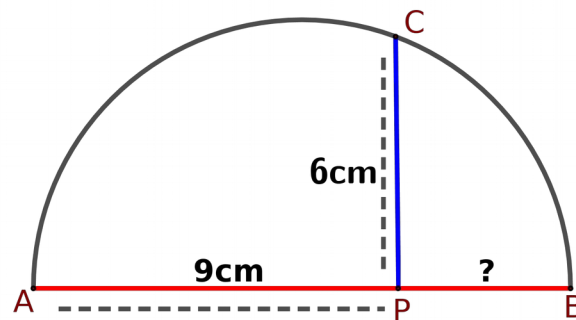
$$PA \times PB = PC^2$$

$$6 \times 4 = PC^2$$

$$PC^2 = 24$$

$$\therefore PC = \sqrt{24} \text{ cm}$$

**Q3) In the picture PA = 9cm, PC = 6cm, find PB ?**



**Ans) Given PA = 9 cm, PC = 6 cm**

$$PA \times PB = PC^2$$

$$9 \times PB = 6^2$$

$$9 \times PB = 36$$

$$PB = \frac{36}{9}$$

$$\therefore PB = 4 \text{ cm}$$

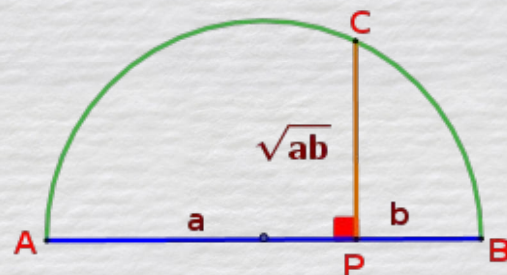
Let PA = a , PB = b

$$PA \times PB = PC^2$$

$$a \times b = PC^2$$

$$PC^2 = ab$$

$$PC = \sqrt{ab}$$



**If PA = a , PB = b**

**then PC =  $\sqrt{ab}$**

**We can use this relation to draw lines of irrational lengths like  $\sqrt{8}$  ,  $\sqrt{15}$  ,  $\sqrt{24}$  etc .**

**Construction 4**

**Q1) Draw a line of length  $\sqrt{12}$  cm.**

**Ans)**

Find two numbers whose product is 12.

4, 3          6, 2          12, 1 are the numbers.

Choose any pair, let us choose 6, 2 .

**Steps**

**1 : Draw line AB of length  $6 + 2 = 8$  cm .**

**2 : Mark the mid point .**

**3 : Draw a semicircle with AB as diameter .**

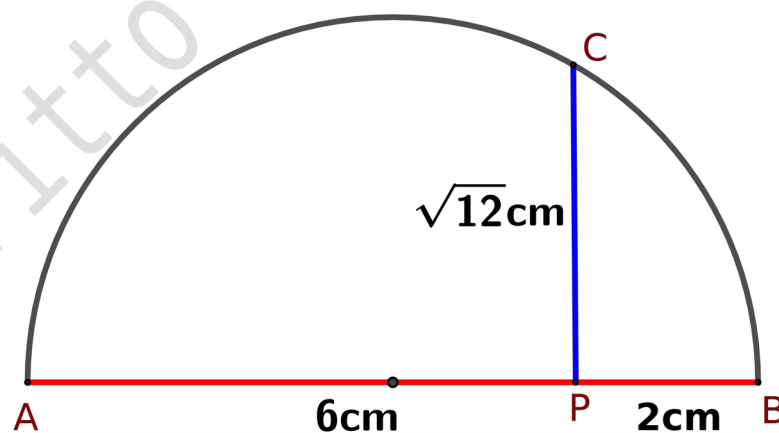
**4 : Mark the point P on AB such that AP = 6cm and PB = 2cm.**

**5 : Through P draw line CP perpendicular to AB.**

$$6 \times 2 = PC^2$$

$$PC^2 = 12$$

$$PC = \sqrt{12} \text{ cm}$$



**Q2) Draw a square of area  $15\text{cm}^2$ .**

**Ans) Given , area of square =  $15\text{cm}^2$**

$$\therefore \text{side of square} = \sqrt{15} \text{ cm}$$

Find two numbers whose product is 15.

5 , 3          15 , 1 are the numbers.

Choose any pair, let us choose 5 , 3 .

**Steps**

**1 : Draw line AB of length  $5 + 3 = 8 \text{ cm}$ .**

**2 : Mark the mid point.**

**3 : Draw a semicircle with AB as diameter .**

**4 : Mark the point P on AB such that  $AP = 5\text{cm}$  and  $PB = 3\text{cm}$ .**

**5 : Through P draw line CP perpendicular to AB.**

$$5 \times 3 = PC^2$$

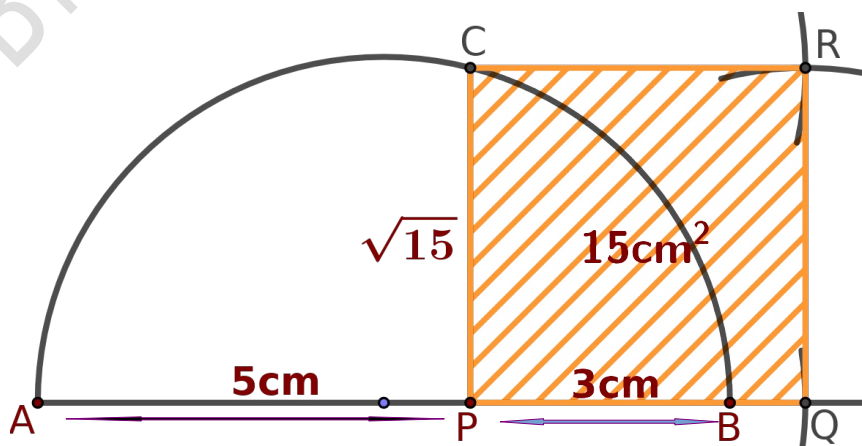
$$PC^2 = 15$$

$$PC = \sqrt{15} \text{ cm}$$

**6 : Extend line PB, measure PC on the compass, using this measurement with P as centre draw an arc on this line and mark the point Q.**

**7 : With the same measurement draw arcs by keeping the compass at Q & C to obtain the point R.**

**Complete the square PQRC.**



**Assignments**

**Q1) Draw a line of length  $\sqrt{7}$  cm .**

**Q2) Draw a square of area  $8 \text{ cm}^2$  .**

**Q3) Draw a square of area  $24 \text{ cm}^2$  .**



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