CONSTRUCTIONS - CIRCLES

1 . *Construction of a right angled triangle with given hypotenuse.*

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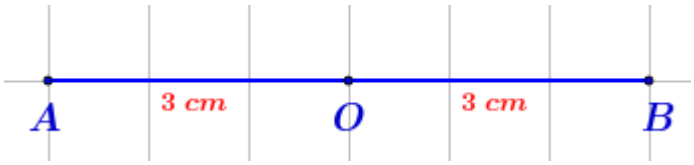

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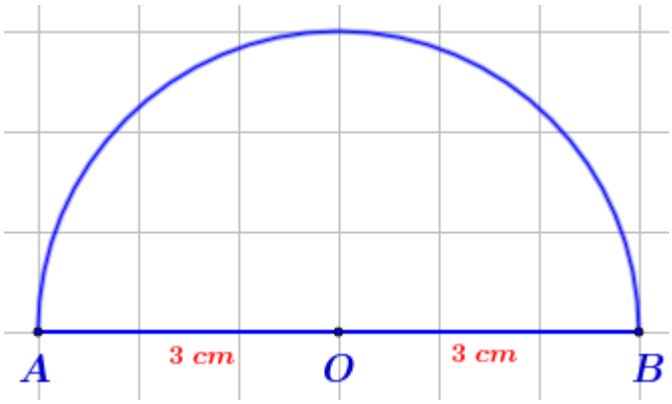

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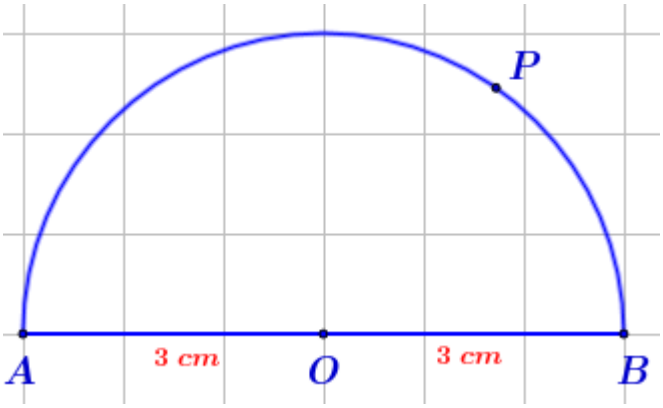

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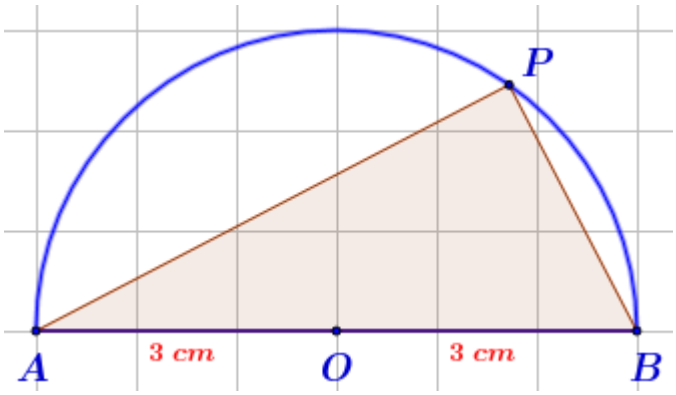

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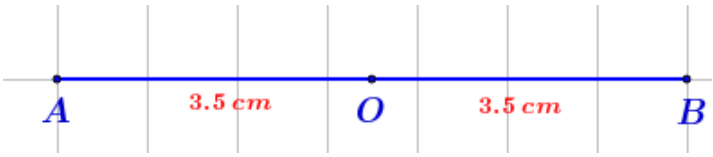

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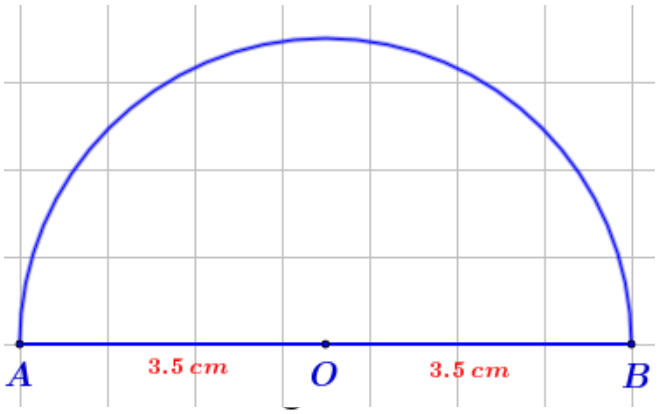

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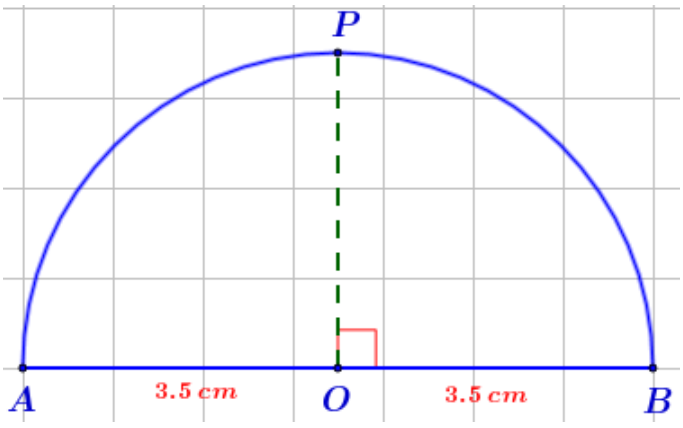

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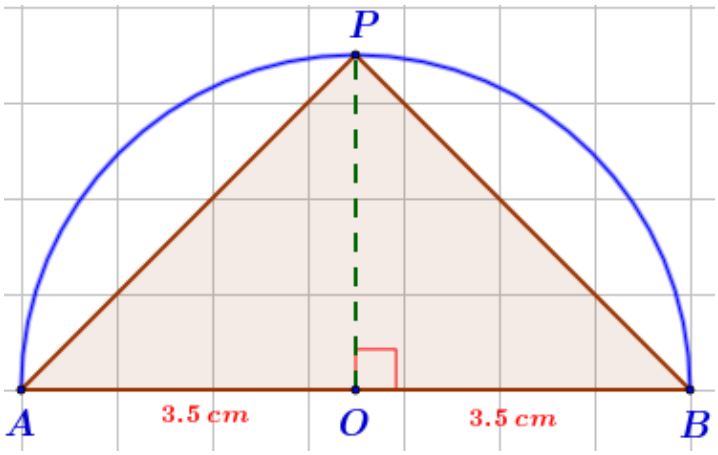

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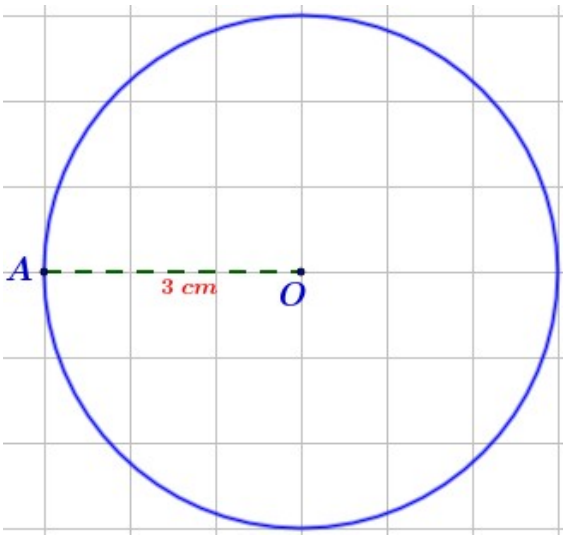

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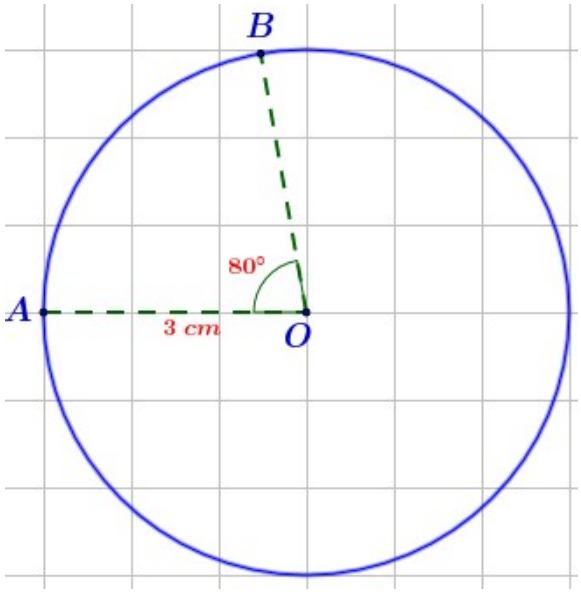

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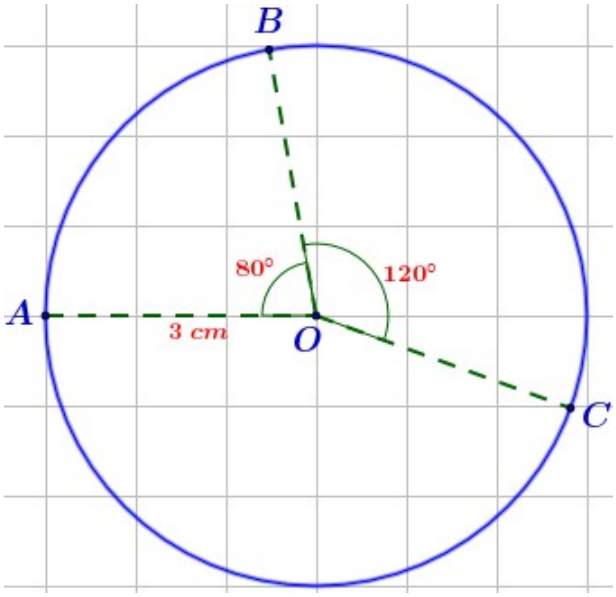

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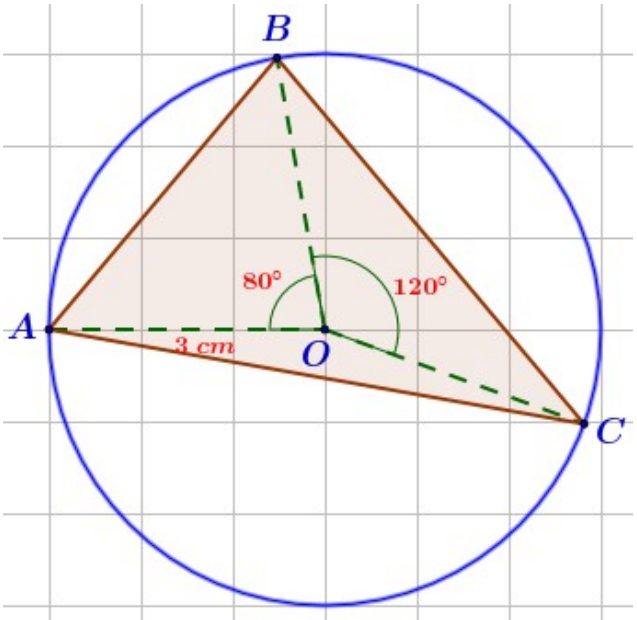

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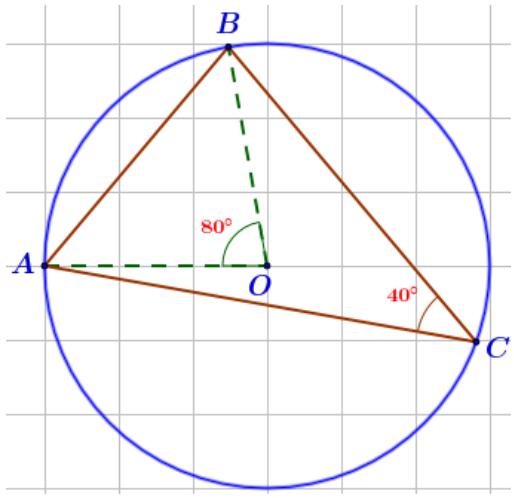

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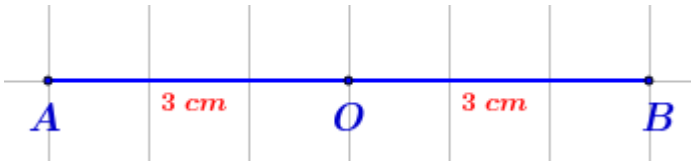

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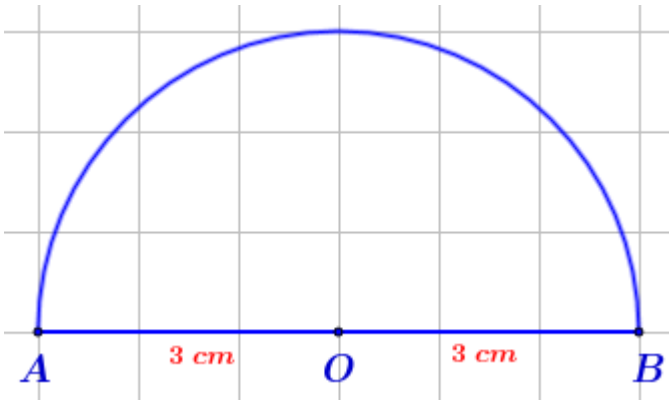

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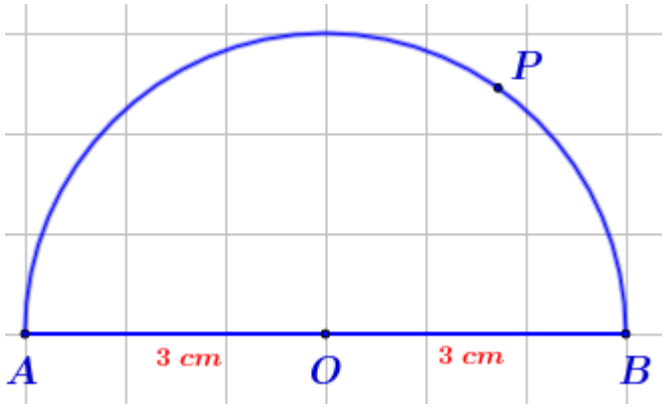

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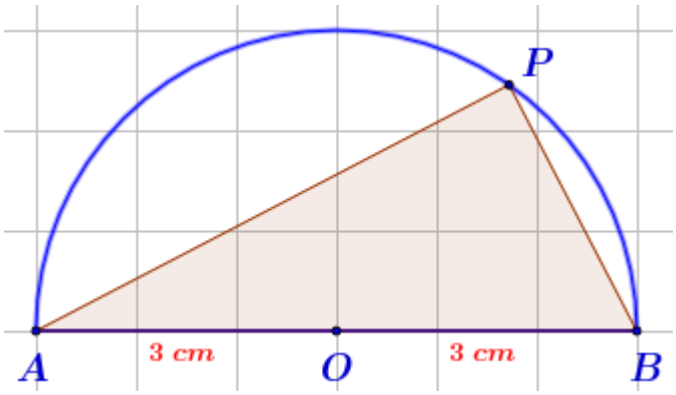

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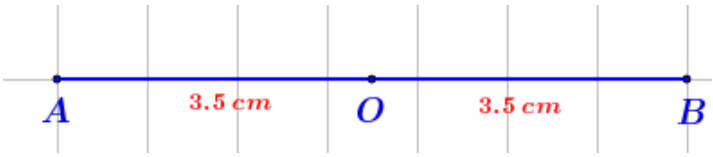

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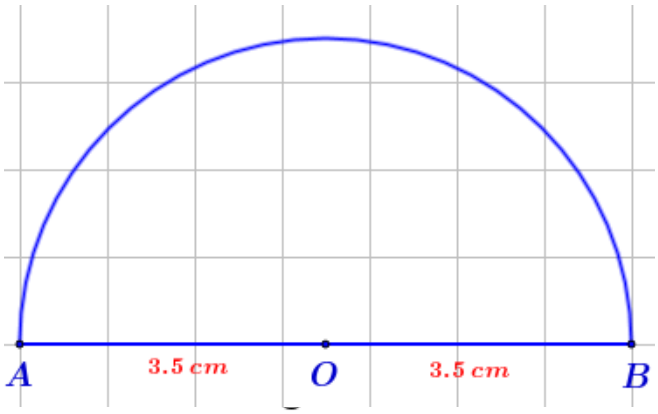

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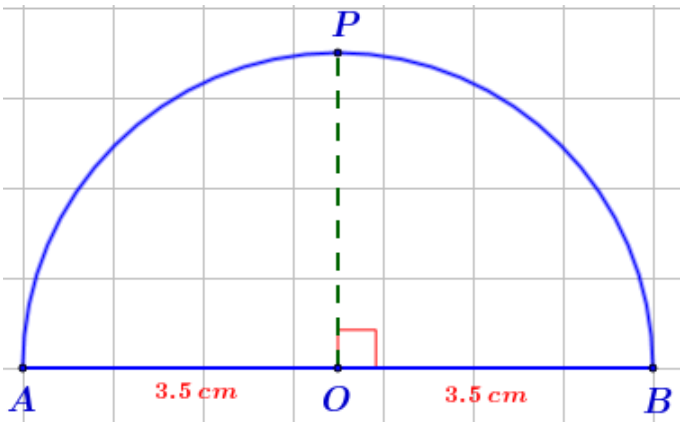

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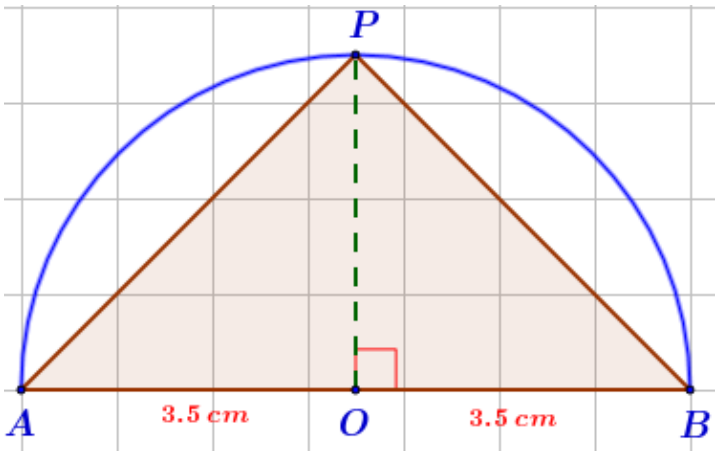

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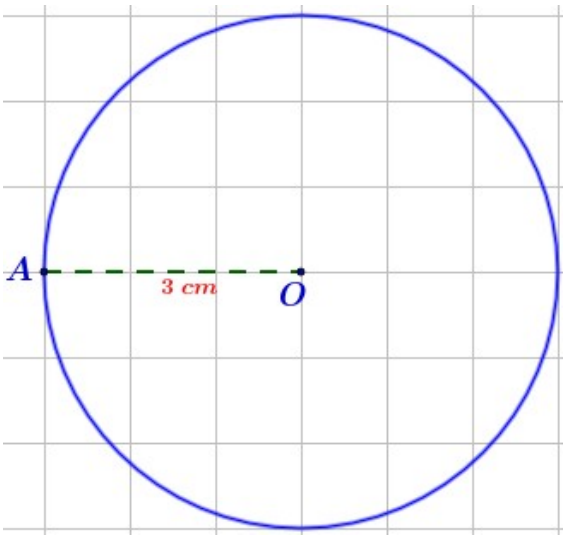

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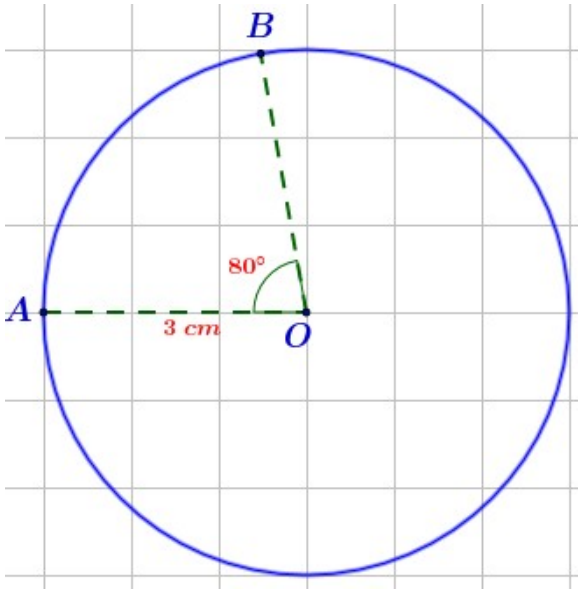

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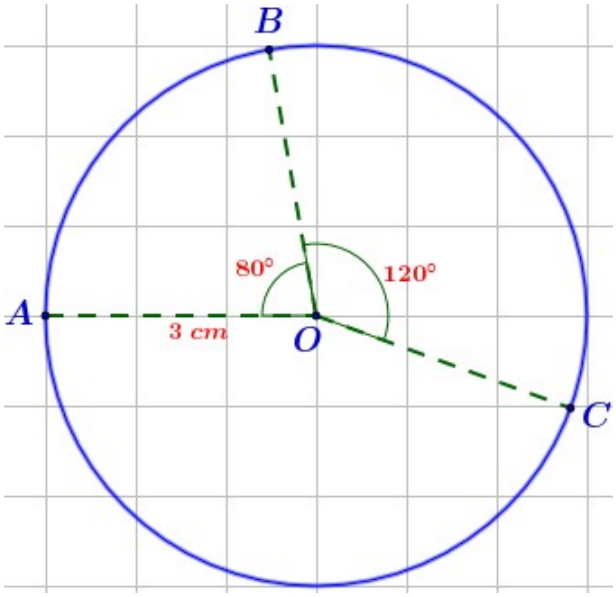

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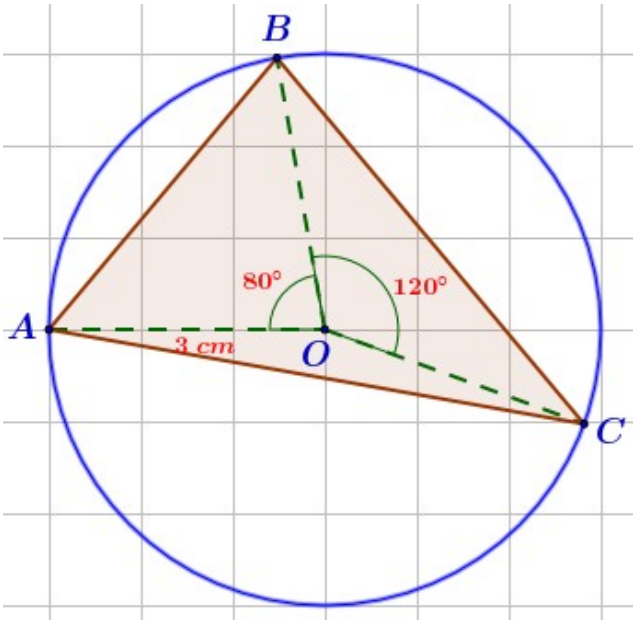

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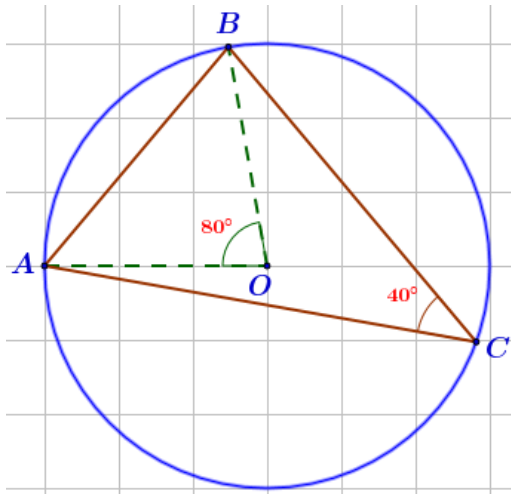

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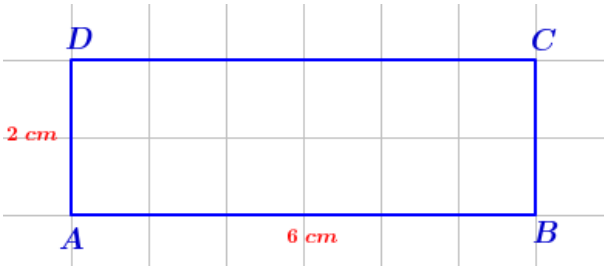

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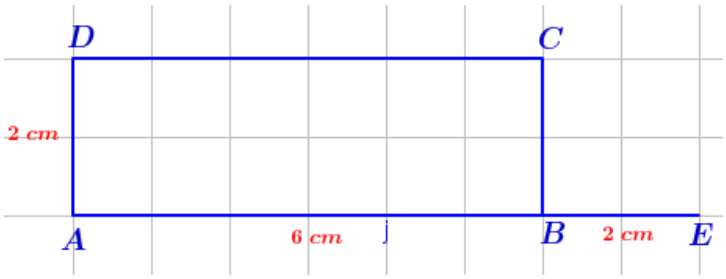

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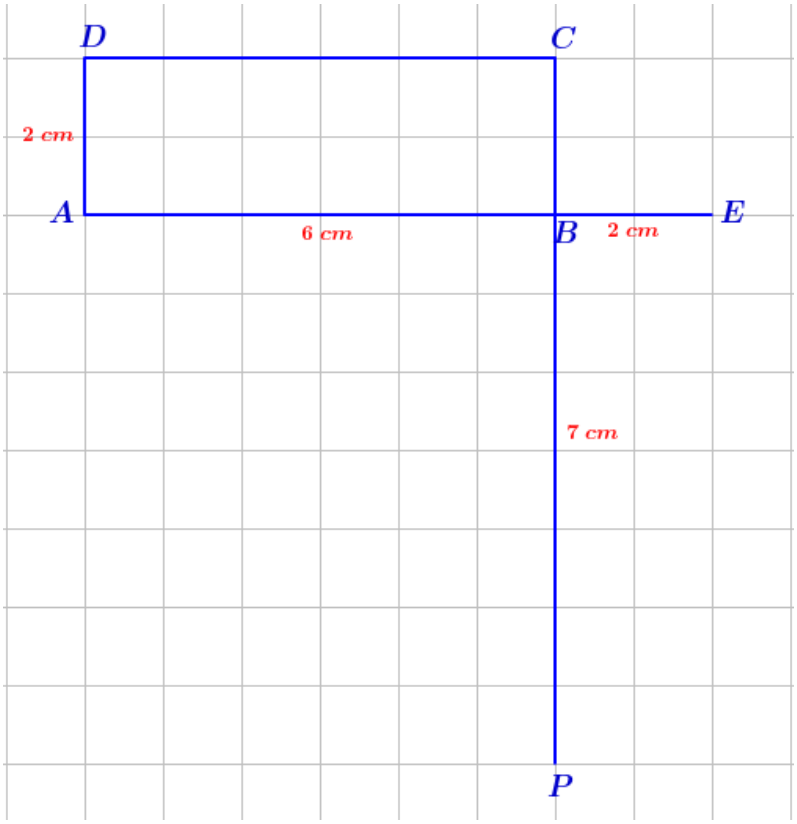

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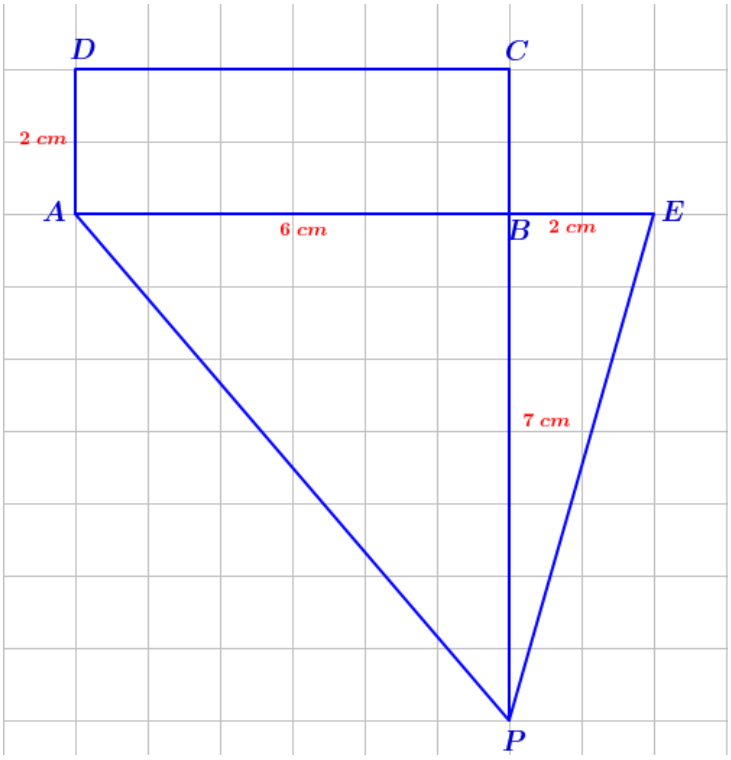
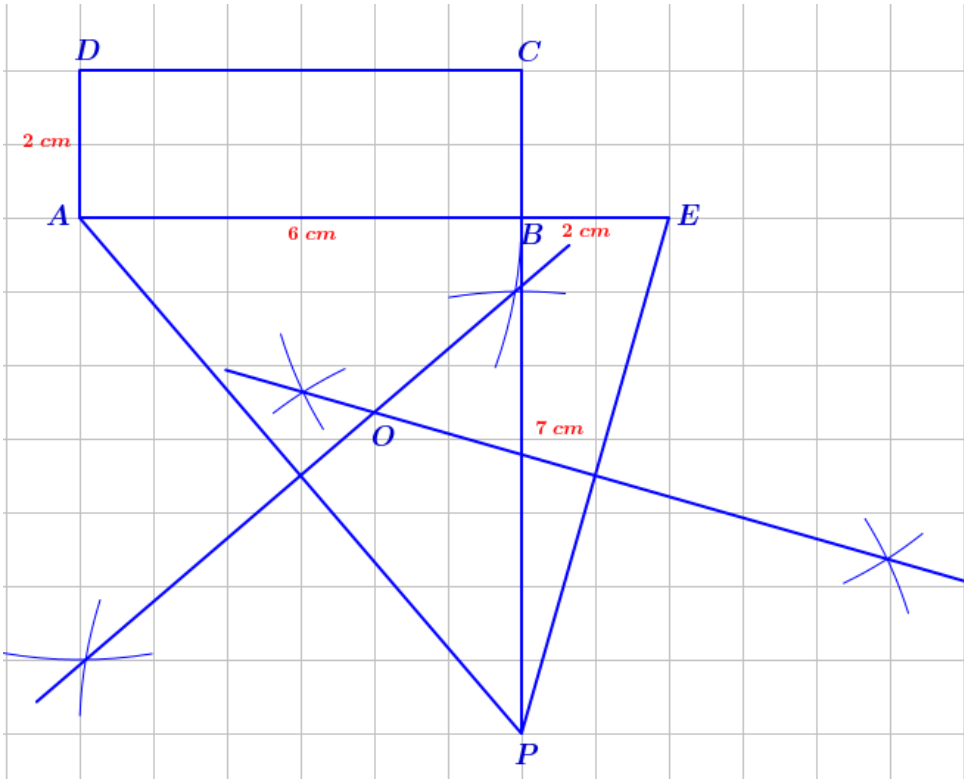
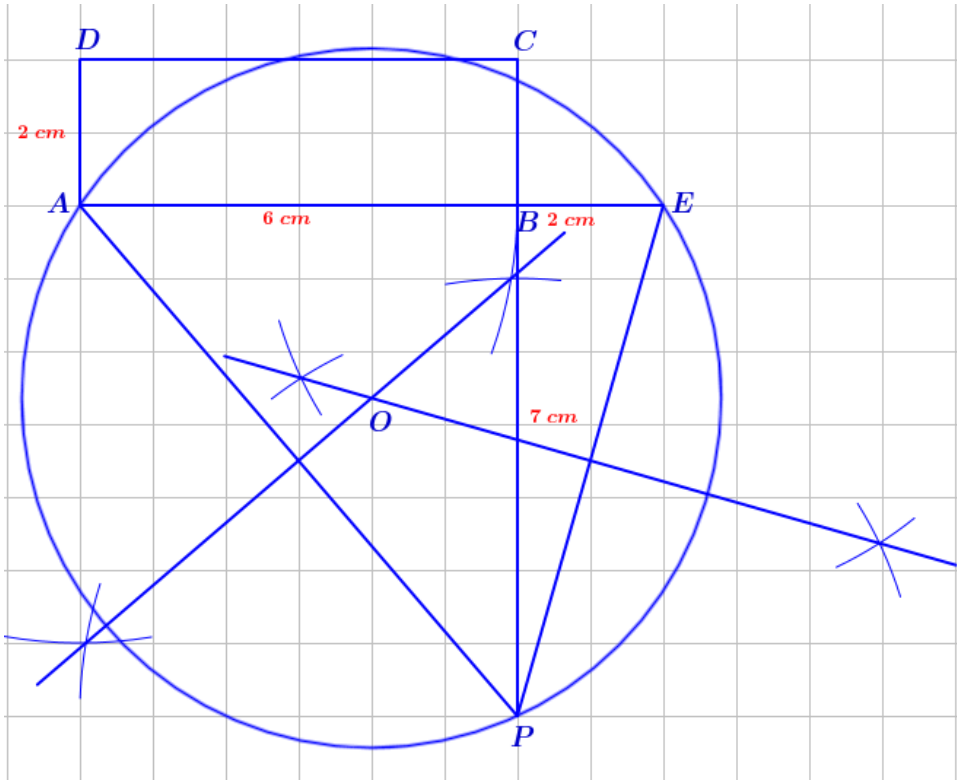


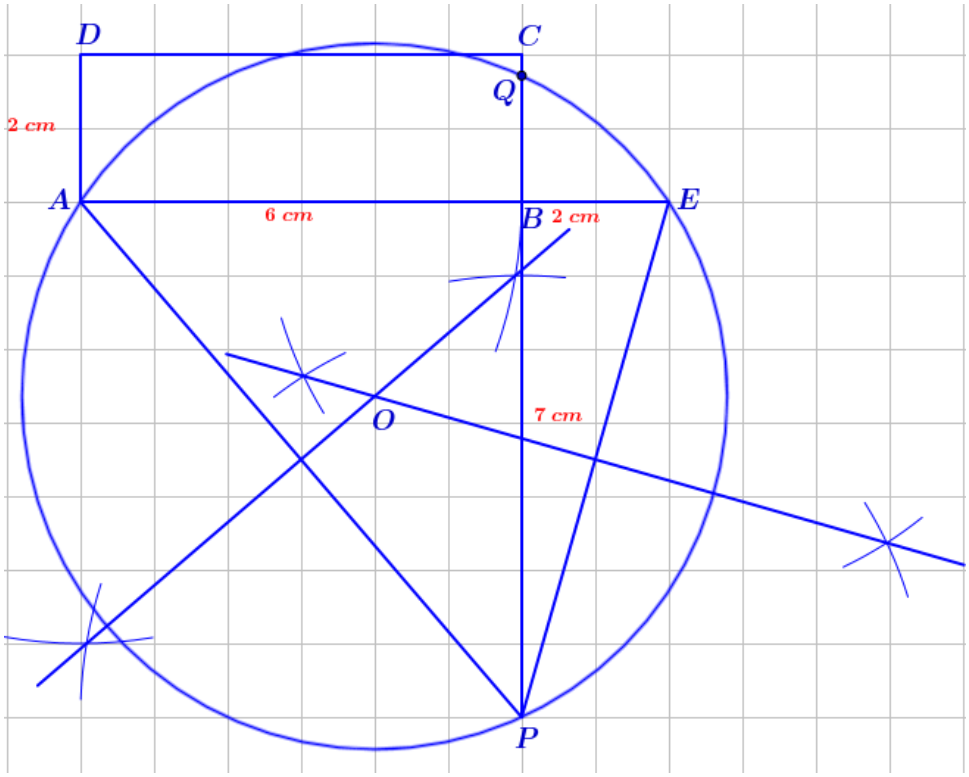
Step 5 : *Draw the perpendicular bisectors of the lines AP and EP . They intersect at O.*



Step 6 : Draw the circumcircle of the triangle AEP. The centre of the circumcircle is O.

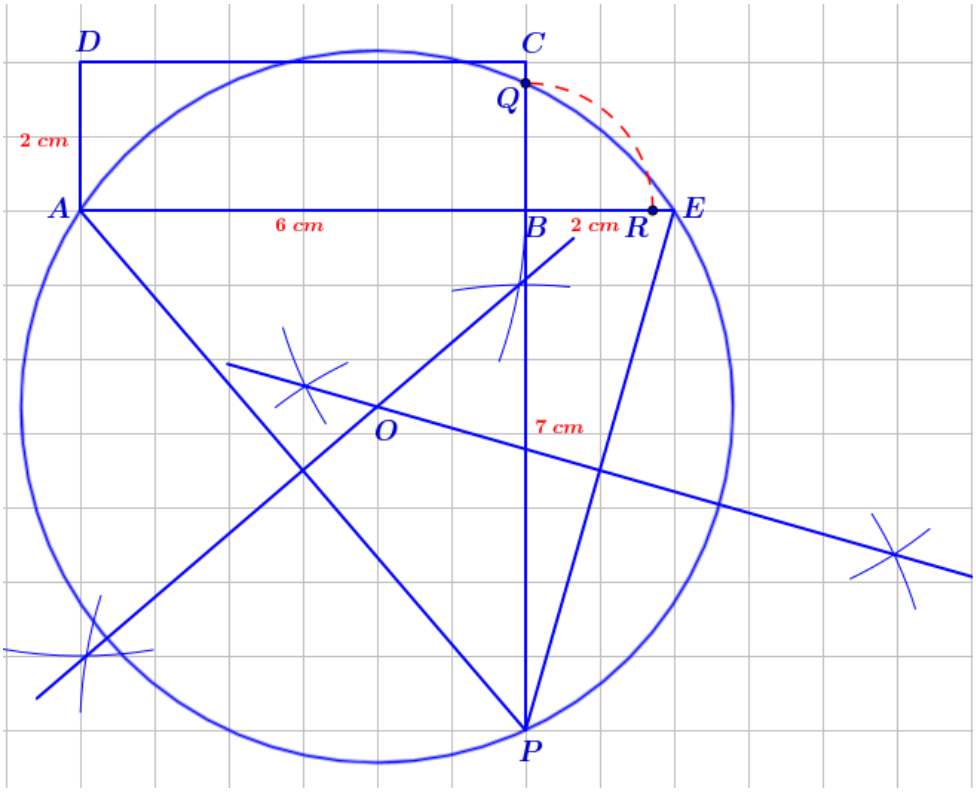


Step 7 : The circumcircle meets the line BC at Q.

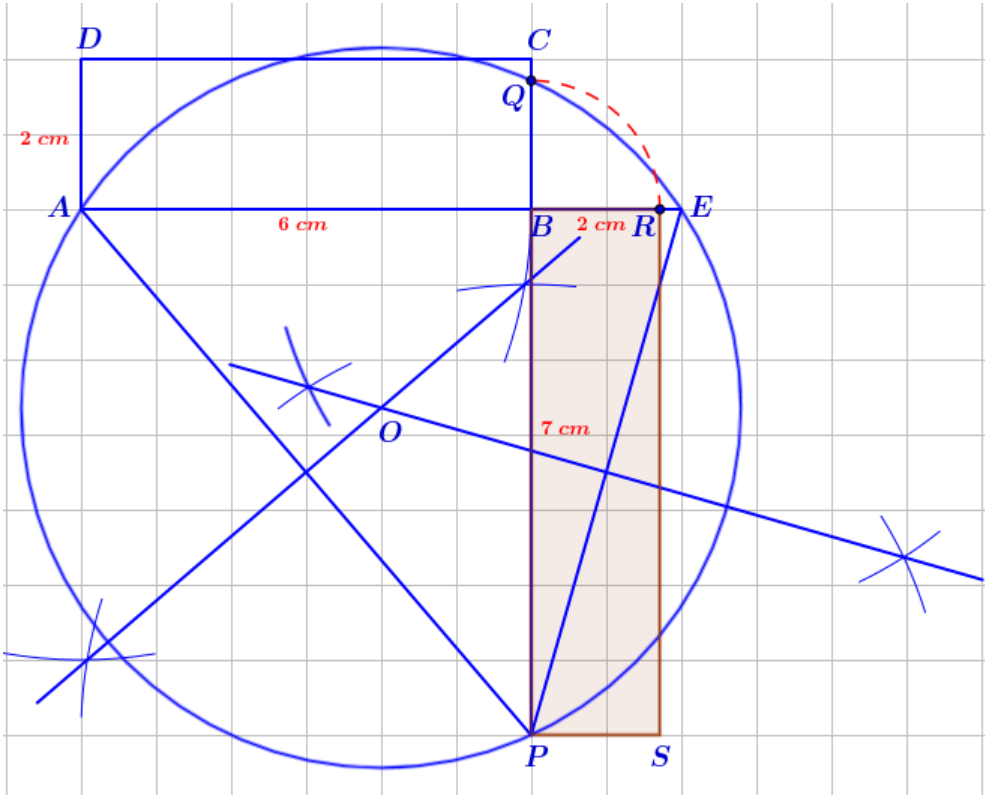


Step 8 : *Draw an arc with centre B and radius BQ. The arc meets the line BE at R.*

(ie, **BQ = BR**)



Step 9 : *Draw a rectangle with width* **BP** *and height* **BR**.



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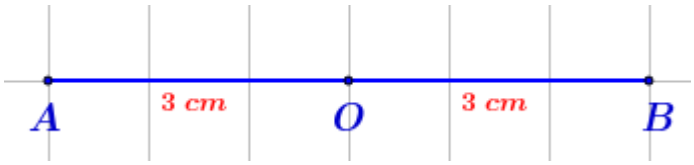

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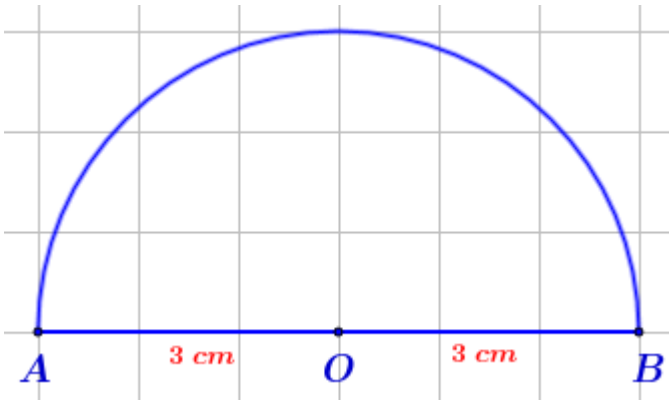

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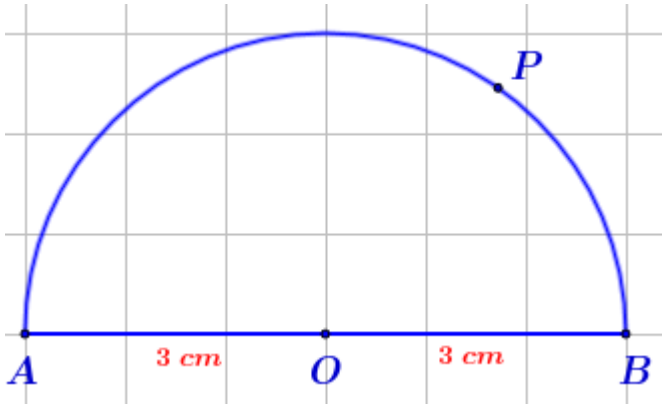

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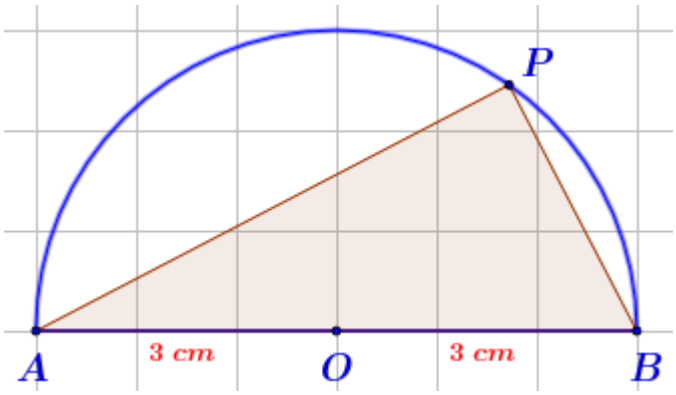

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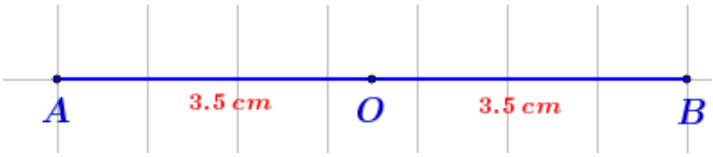

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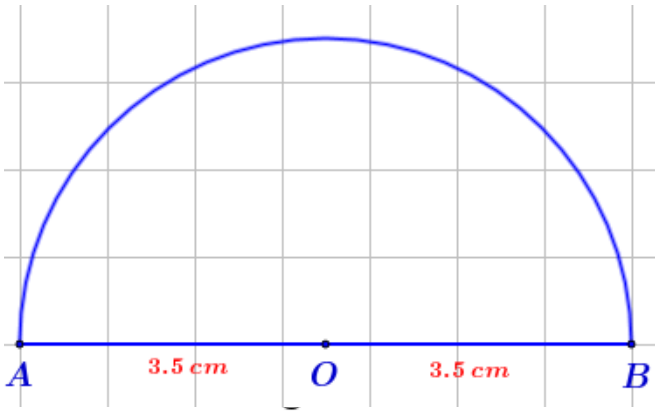

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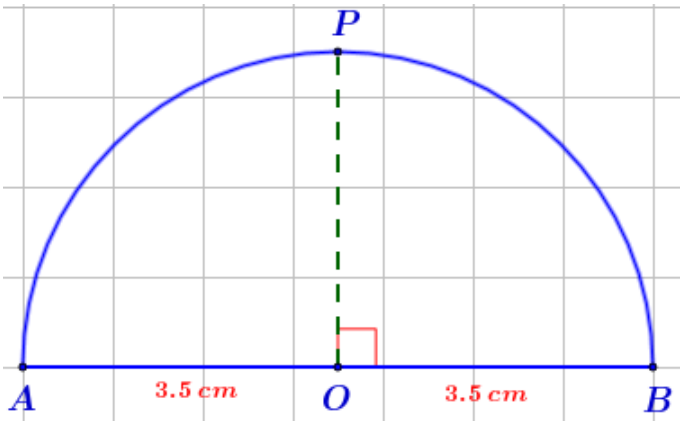

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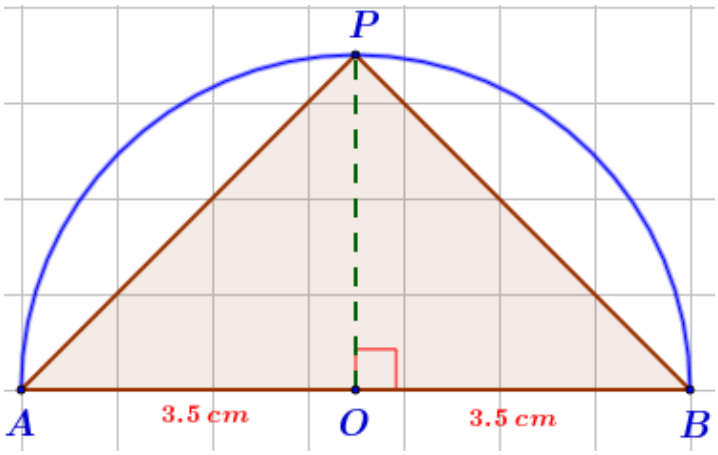

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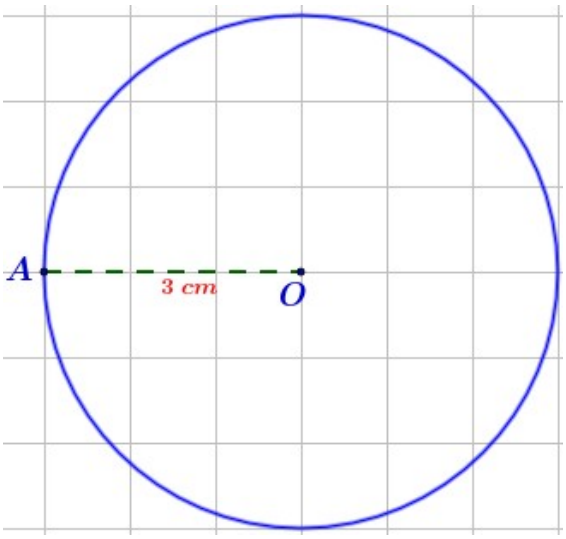

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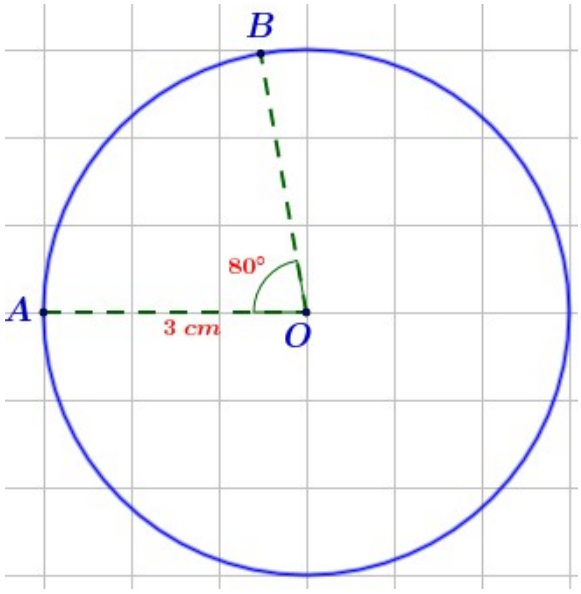

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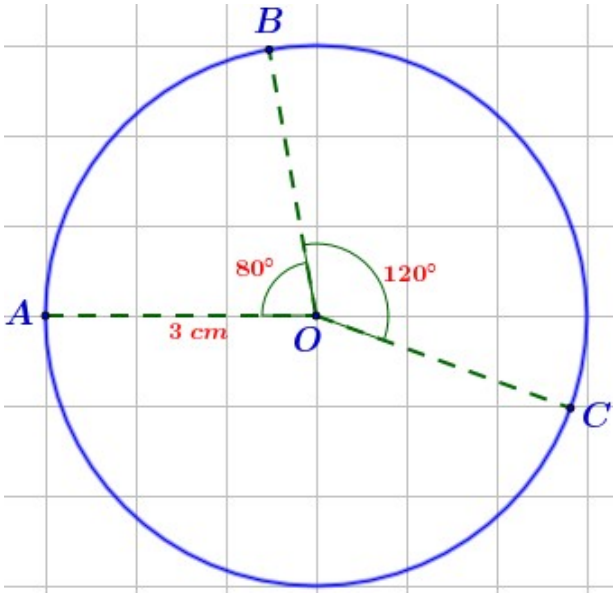

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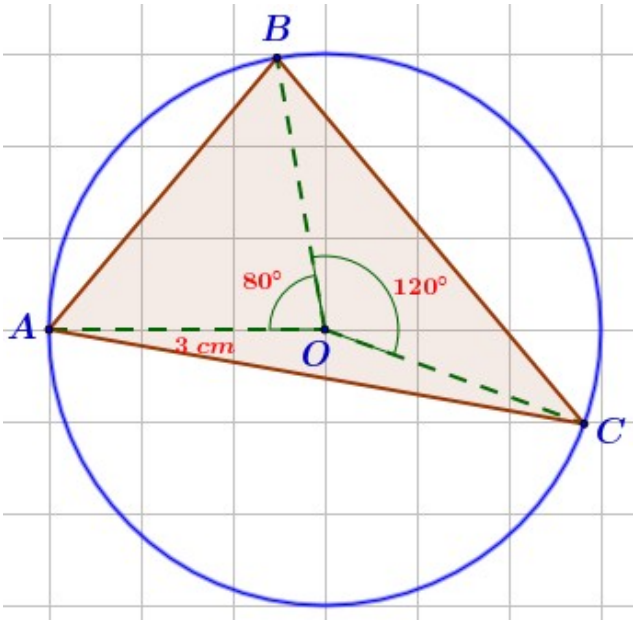

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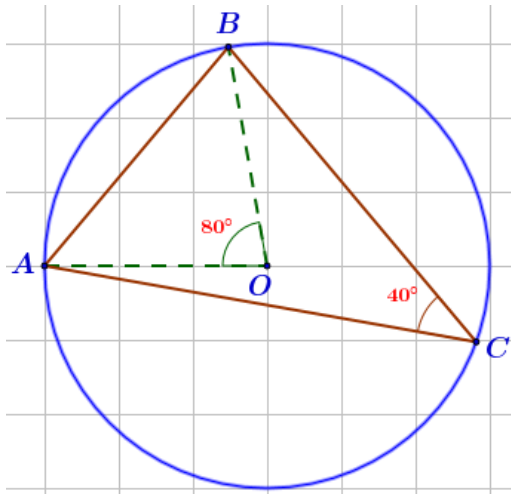

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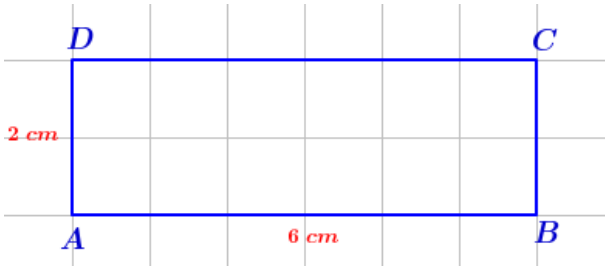

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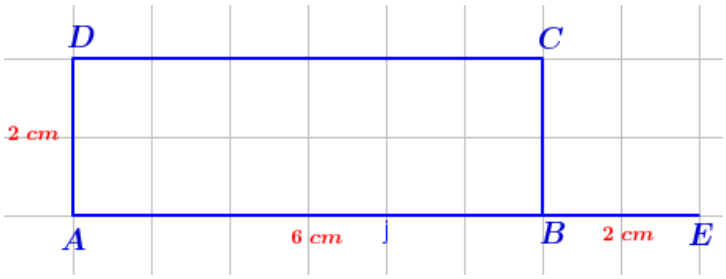

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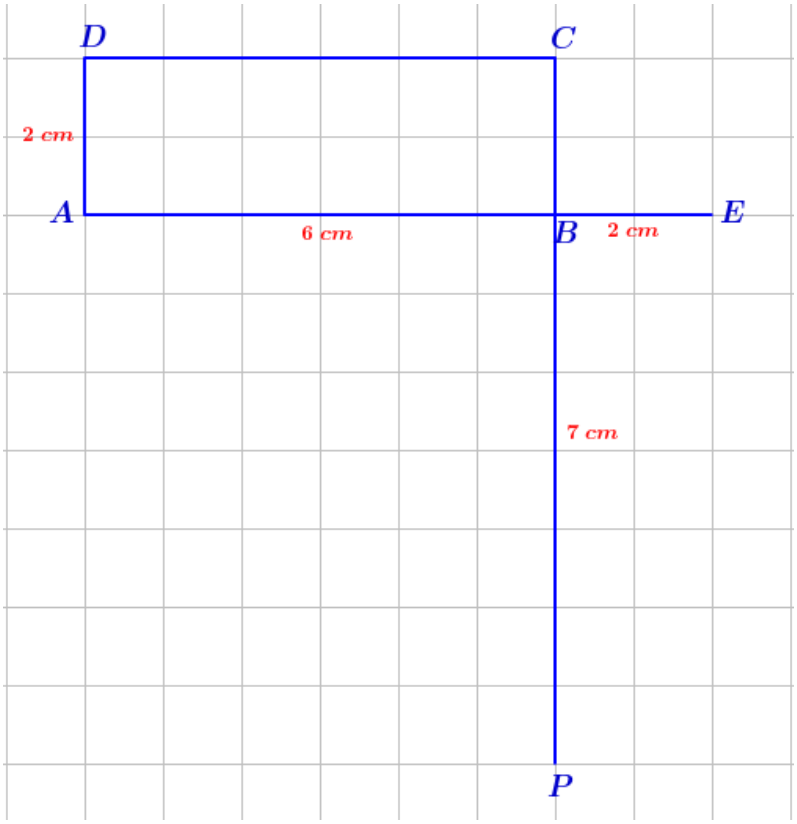
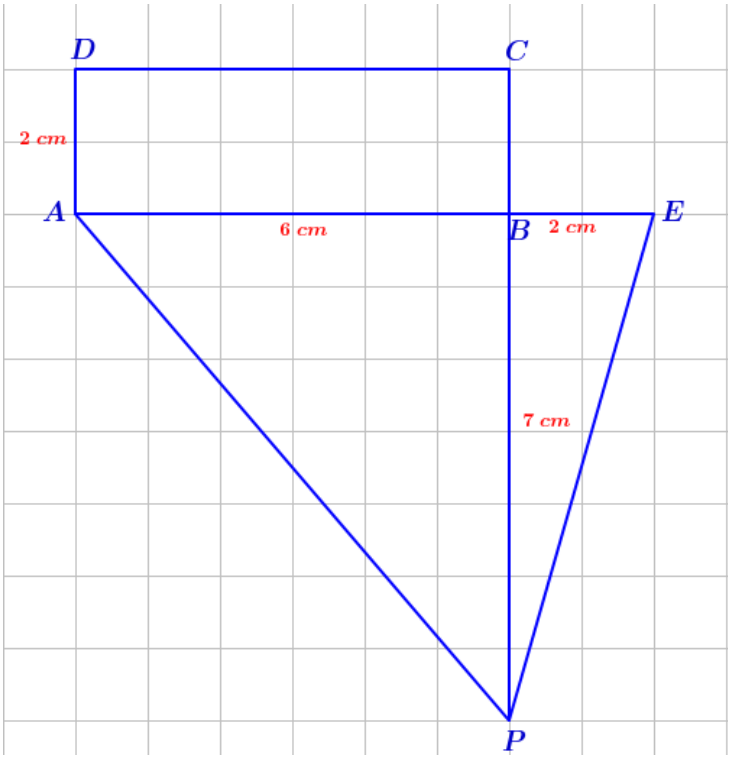
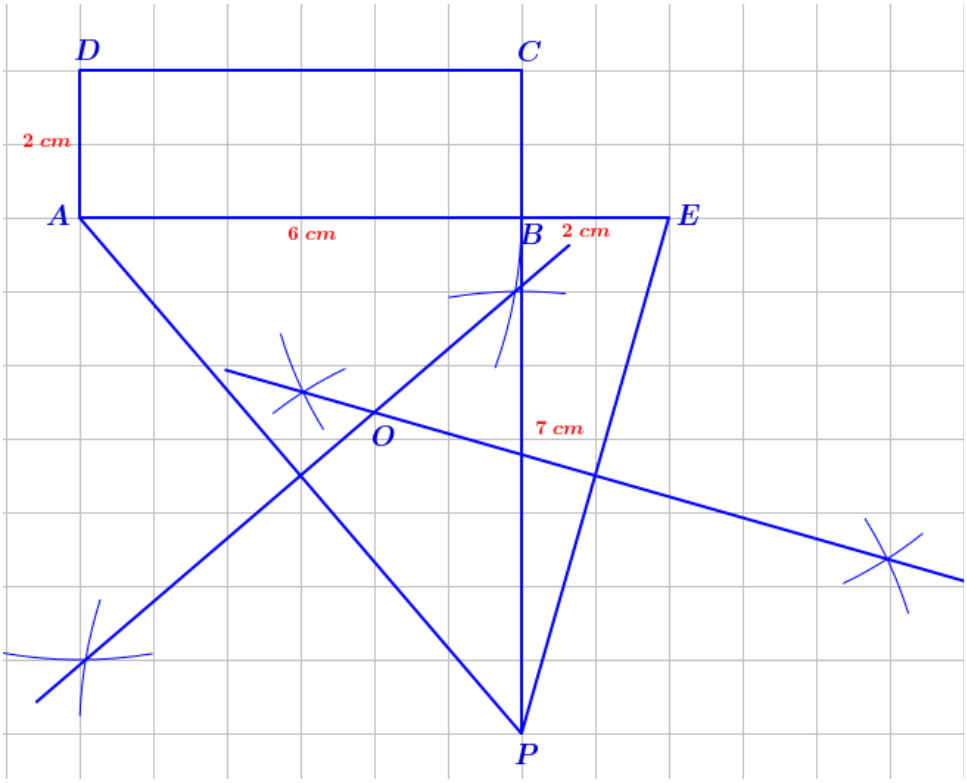


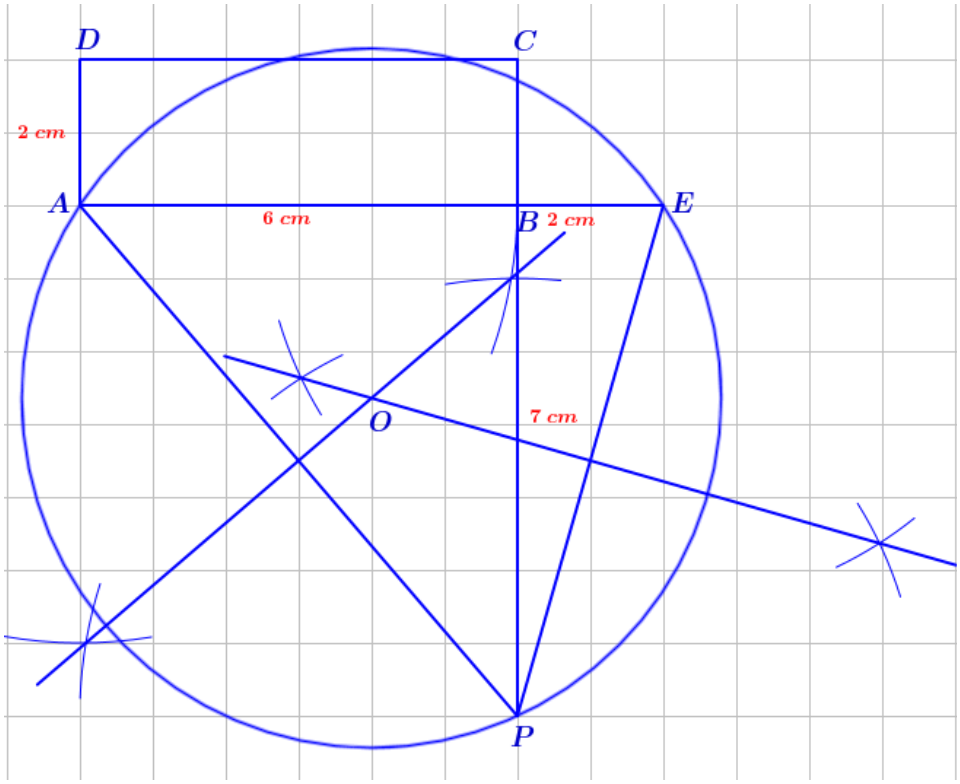
Step 4 : *Join the points A , E and P to form a triangle.*



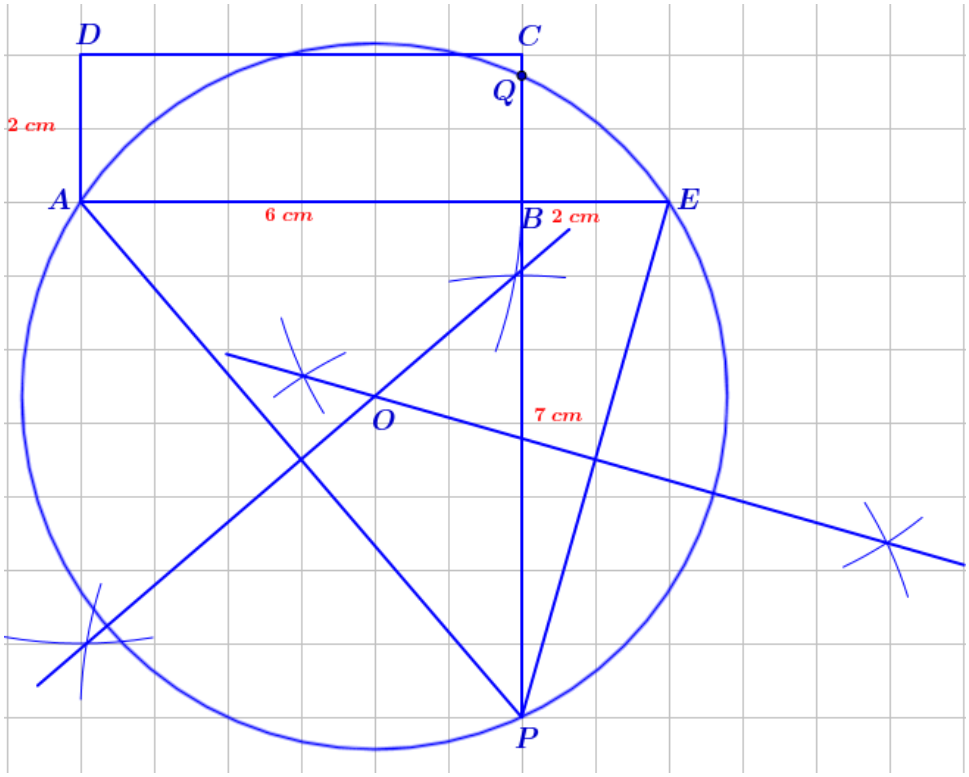
Step 5 : *Draw the perpendicular bisectors of the lines AP and EP . They intersect at O.*



Step 6 : Draw the circumcircle of the triangle AEP. The centre of the circumcircle is O.

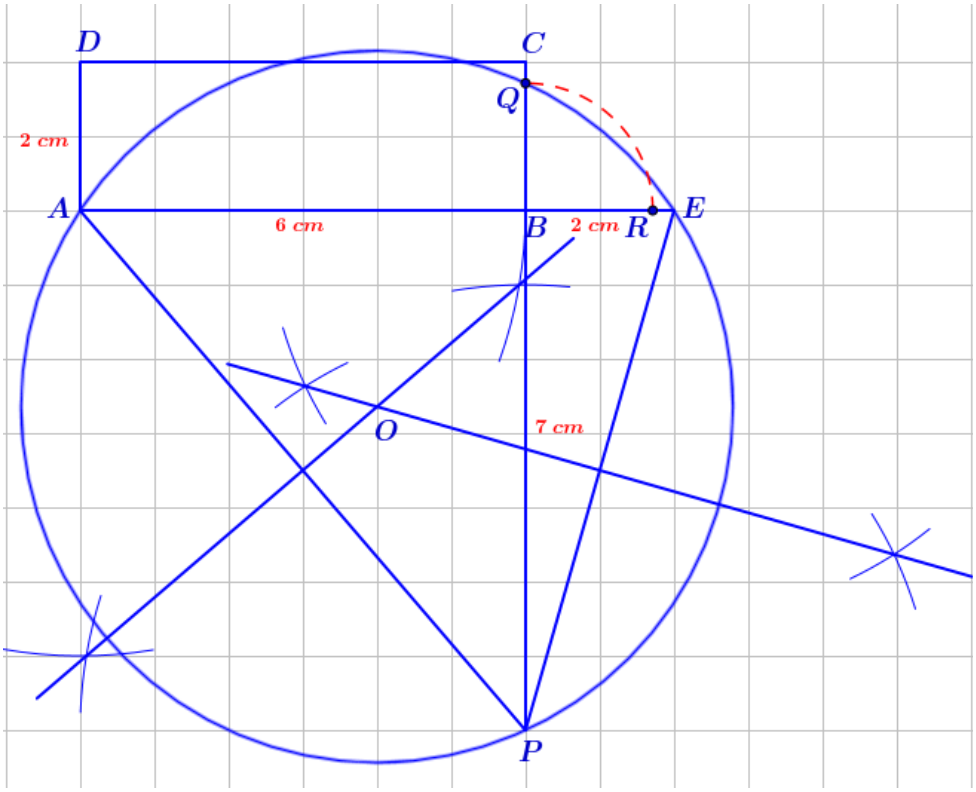


Step 7 : The circumcircle meets the line BC at Q.

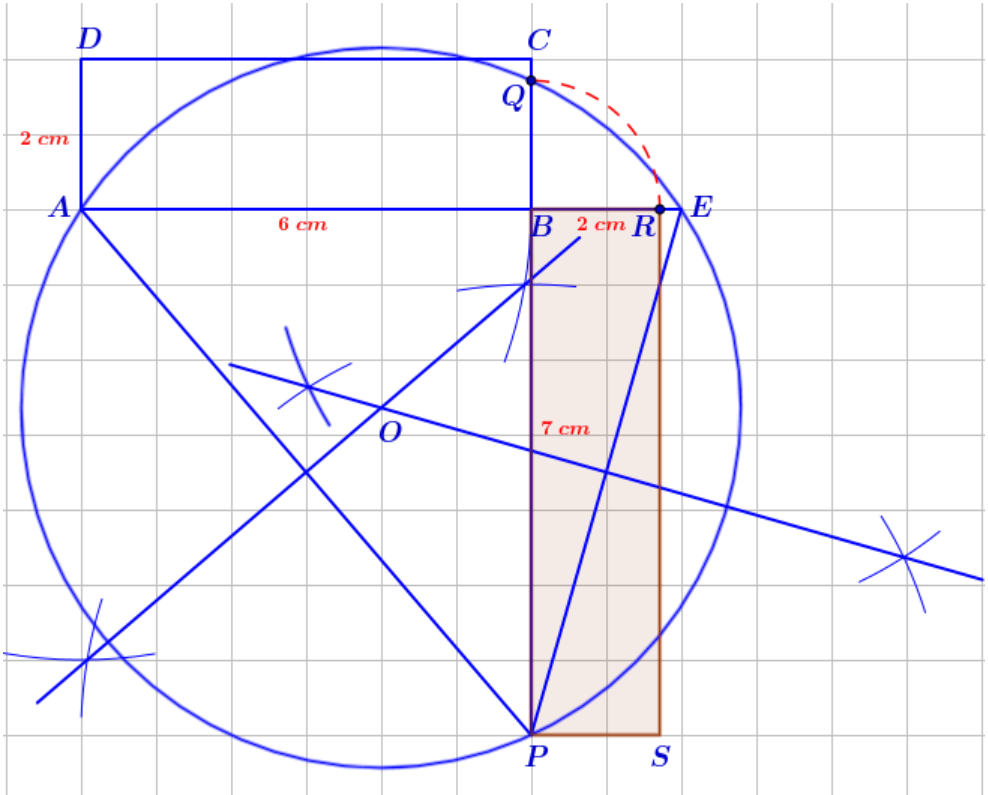


Step 8 : *Draw an arc with centre B and radius BQ. The arc meets the line BE at R.*

(ie, ***BQ = BR***)



Step 9 : *Draw a rectangle with width* ***BP and height*** *BR.*



4 .Construction of a square of given area same as that of a rectangle.

Learning objective :

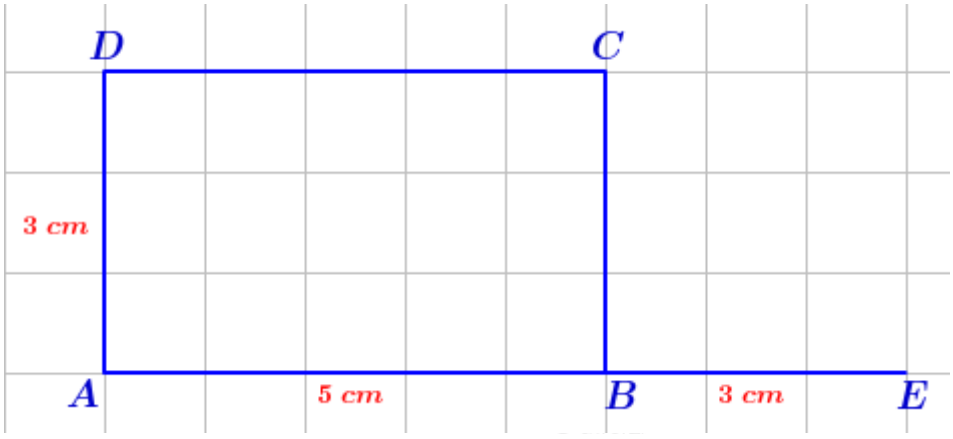
The product of the parts into which a diameter of a circle is cut by a perpendicular chord, is equal to the square of half the chord.

ie, **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.**

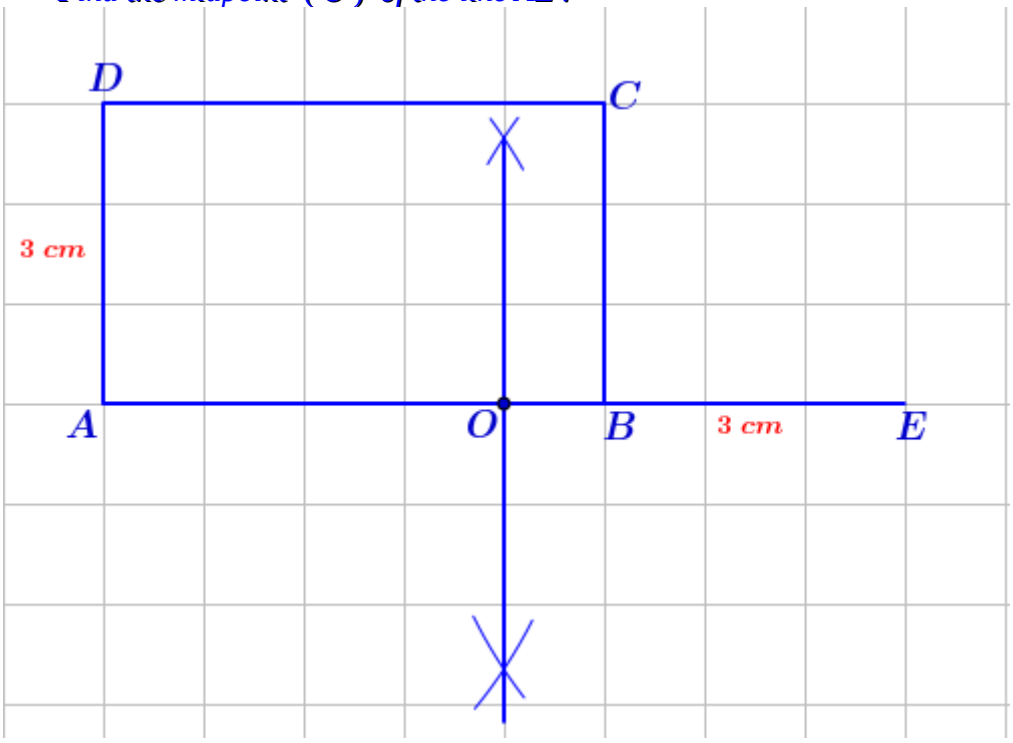
● *Draw a rectangle of width 5 cm and height 3 cm. Draw a square of the same area .*

Step 1 : *Draw a rectangle of width 5 cm and height 3 cm.*

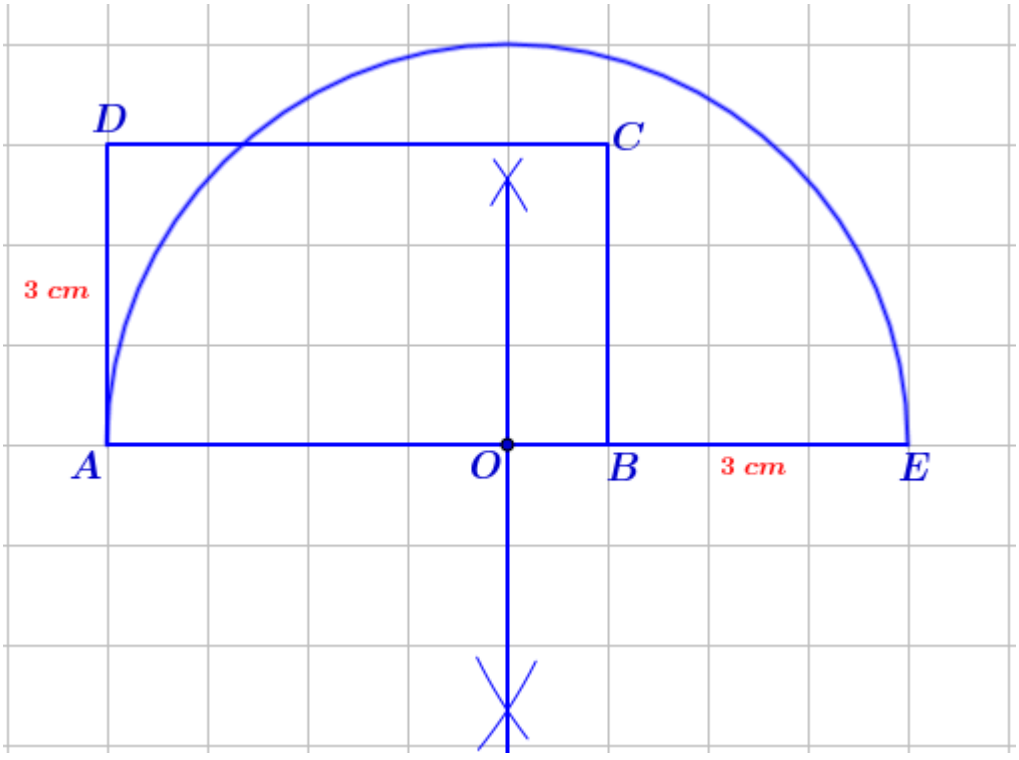
Step 2 : *Extend the line AB by 3 cm.*



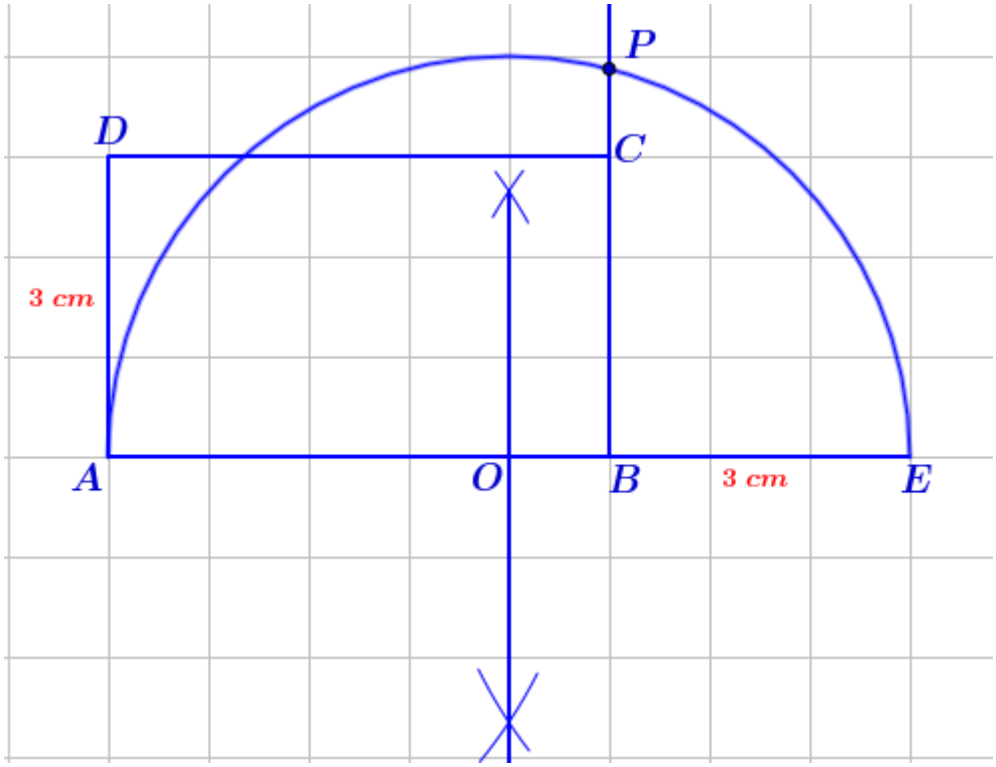
Step 3 : *Find the midpoint (O) of the line AE .*



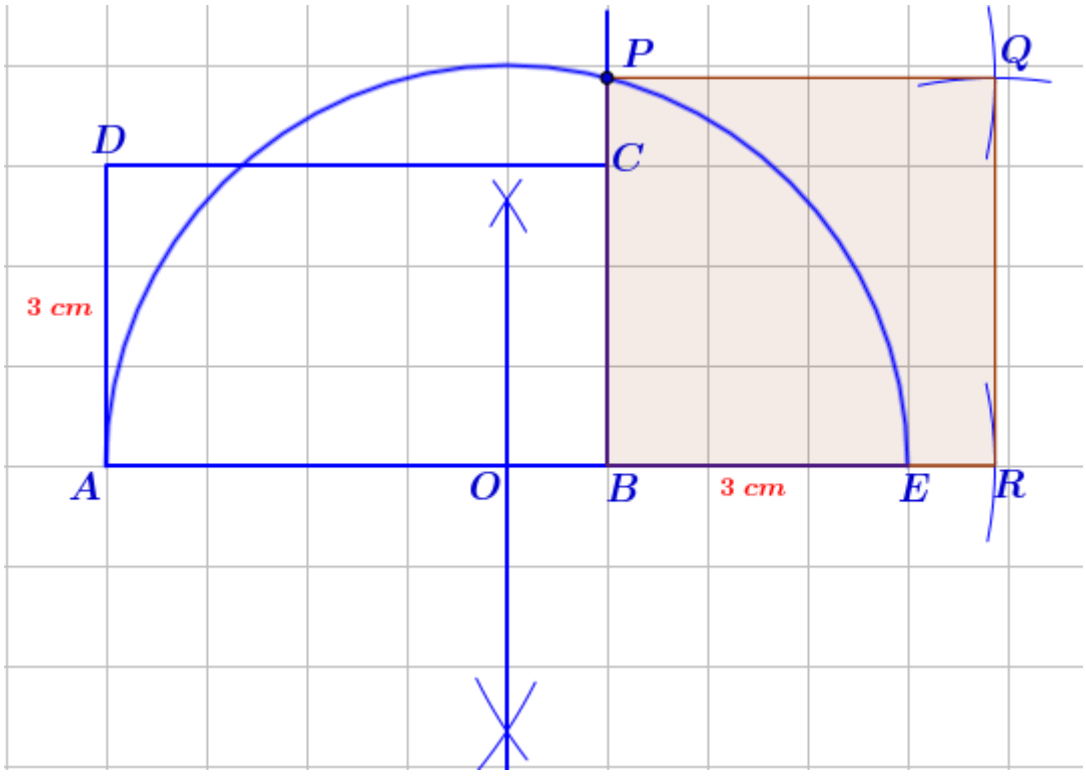
Step 4 : *Draw a semicircle with O as centre and AE as diameter.*



Step 5 : *Extend the line BC and it meets the semicircle at P .*

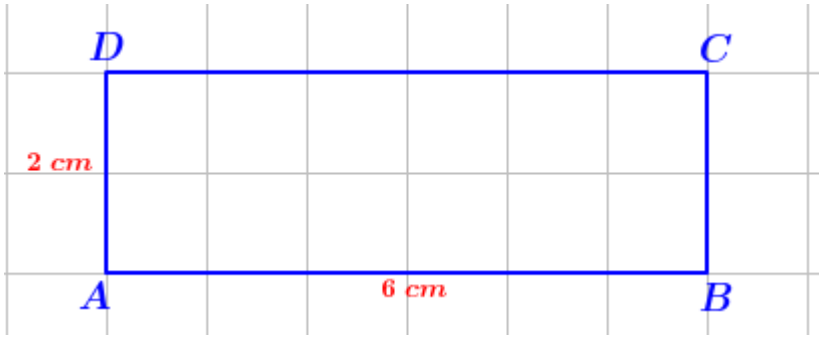


Step 6 : *Draw a square with BP as side.*

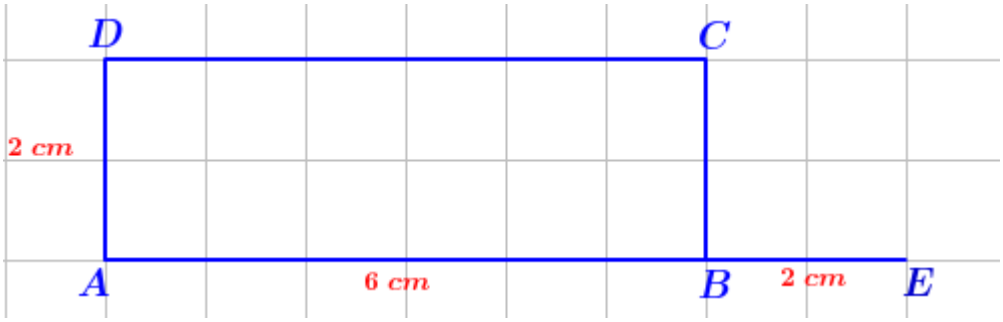


● *Draw an equilateral triangle of side* $\sqrt{12}$ *cm* ($2\sqrt{3}$ *cm*) .

Step 1 : *Draw a rectangle of width* 6 *cm and height* 2 *cm.*



Step 2 : *Extend the line AB to outside by* 2 *cm.*



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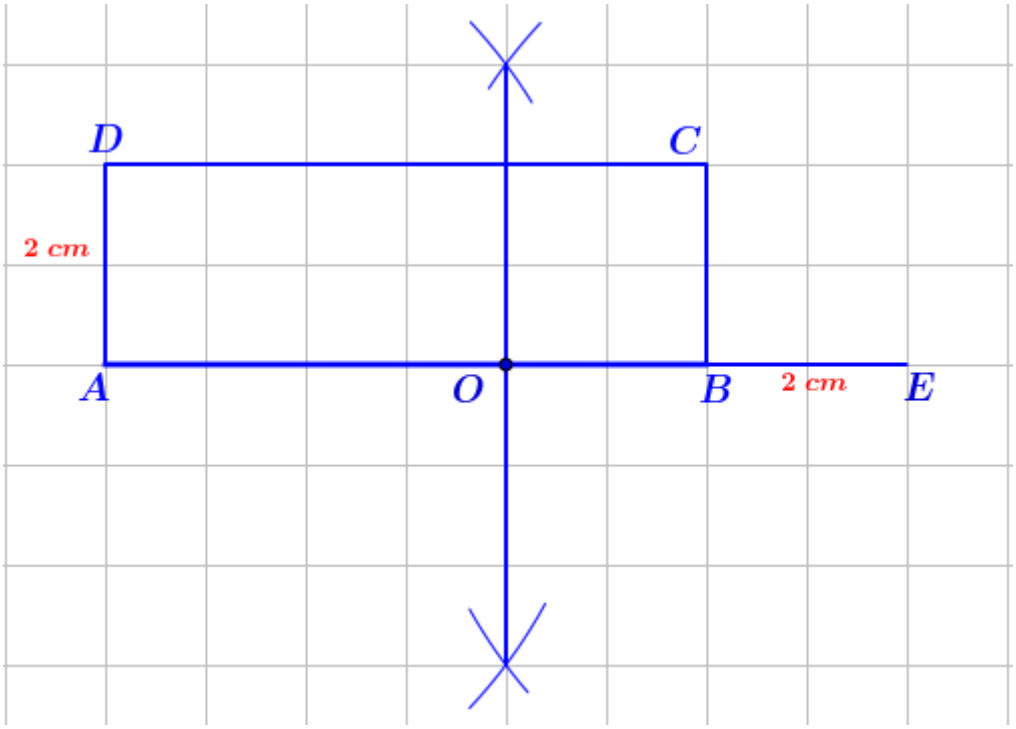
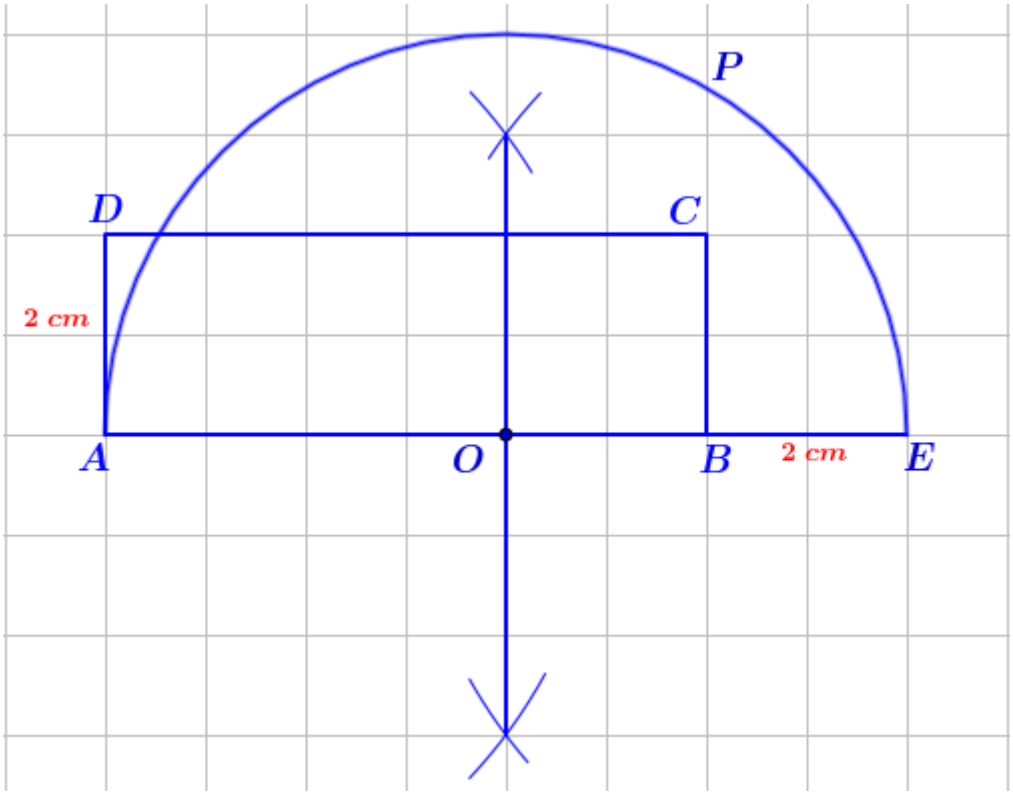
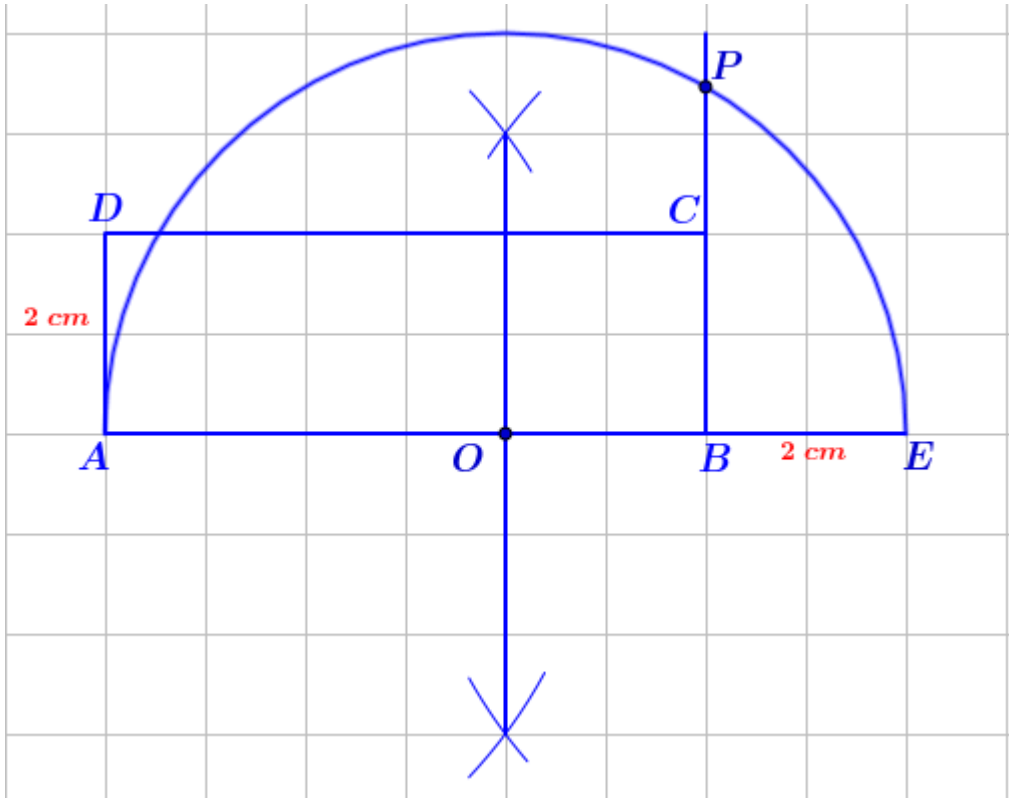
Step 3 : *Find the midpoint* (*O*) *of the line AE .*



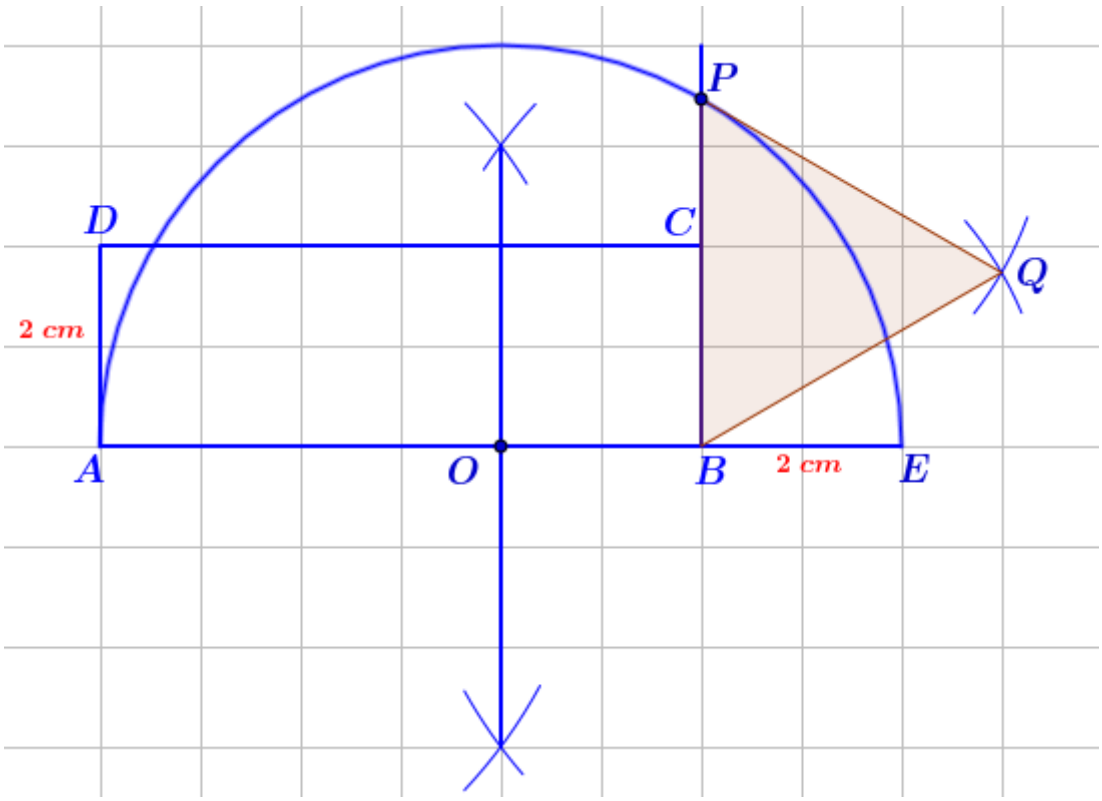
Step 4 : *Draw a semicircle with O as centre and AE as diameter.*



Step 5 : *Extend the line BC and it meets the semicircle at P .*



Step 6 : *Draw an equilateral triangle with BP as side.*



NB:

$$AB \times BE = BP^2$$

$$6 \times 2 = BP^2$$

$$BP^2 = 12$$

$$BP = \sqrt{12} = 2\sqrt{3}\ cm$$

(*We can take a rectangle of sides 4 cm and 3 cm for this construction . Any rectangle of area 12 cm² can be taken for this construction*)