2020-21 Academic year Works

Mathematics X

Circles

16

Concepts

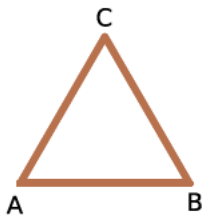
a) Angle in the semicircle is $90°$

b) Angle outside the semicircle is less than $90°$

c) Angle inside the semicircle is greater than $90°$

Worksheet16

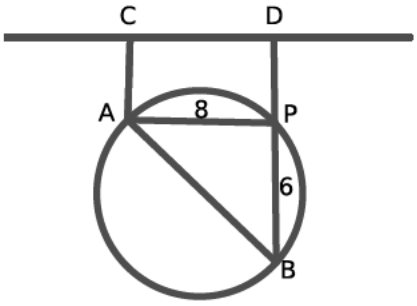
1) $ABC$is a triangle in which $AB = AC = BC$



a) What are the measure of its angles?

b) What is the position of the vertex C based on the circle with diametreAB?Is it inside ,outside or on the circle.

2) In the figure AB is the diametre of the circle.AC and $PD$are perpendicular to CD

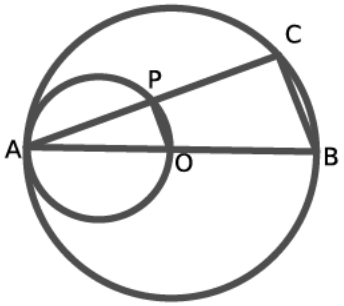


a) What is the measure of angle APB?

b) Suggest a suitable name to $ACDP$

c) If $AP = 8$cm and $BP = 6$cm then what is the radius of this circle?

3) O is the centre of the circle with diametre AB.Another circle is drawn with AOas the diametre



a) What are the measure of $\angle APO, \angle ACB$

b) Outer circle has radius 5cm and $BC = 8$cm . What is the length OP?

c) Is $AP = PC$? Why? [d)] What is the length of AC?

4) Draw a circle of radius 3cm and construct a rectangle with vertices on the circle. One side of the rectangle should be 4cm . What is the lengh of other side?(Write the measurement)

5) Sides of triangle $ABC$are $AB = 5$cm, $AC = 12$cm ,$BC = 13$cm

a) What kind of triangle is this ?

b) What is the position of A based on the circle with diametre BC?

c) What is the position of C based on the circle with diametre AB?

d) What is the position of B based on the circle with diametre AB?

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2020-21 Academic year Works

Mathematics X

Circles

17

Concepts

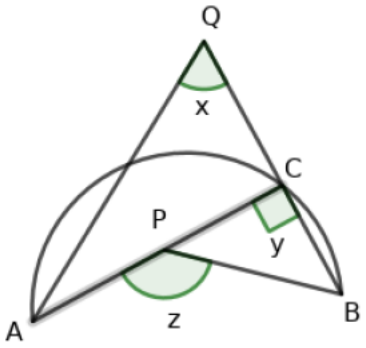
a) Angle in the semicircle is 90°

b) Angle outside the semicircle is less than 90°

c) Angle inside the semicircle is greater than 90°

Worksheet17

1) In the figure AB is the diametre of a semicircle.Three angles x, y, z are marked outside, on the semicircle and inside the semicircle.



a) What is the value of y?

b) If x, y, z are in an arithmetic sequence,then what is $x + z$?

c) If the common difference of the sequence is 50 then find x and z

2) a) Draw a circle of radius 3cm. Construct a square with vertices are on the circle.

b) What is the length of its side?

c) Calculate the area of the square.

3) In triangle ABC, $AB = AC$.A circle is drawn with one of these sides as diametre.Prove that the circle biscts the side BC

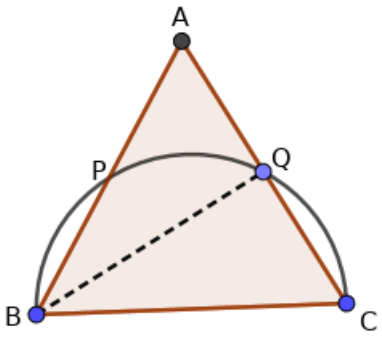
4) The sides of a triangle are $\sqrt{2}, \sqrt{3}$ and $\sqrt{5}$.

   a) What kind of triangle is this?

   b) What is the position of the vertex opposite to the side $\sqrt{5}$based on a circle with this side as the diametre?

   c) What is the position of other two vertices based on this circle?

5) ABC is an equilateral triangle.A semicircle is drawn with diametre BC. Semicircle intersect the sides at P and Q.



   a) What is the measure of angle BQC?(Draw angle in the figure)

   b) What are the angles of triangle ABQ and triangle BQC

   c) Prove that the semicircle bisects the side AB and AC

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2020-21 Academic year Works

Mathematics X

Circles

18

Concepts

a) An arc of a circle can make three type of angles. Angle on the arc, angle at the centre and angle in the complement

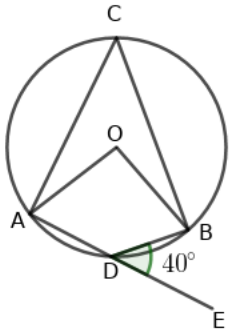
b) Angle formed by the arc in the complement is half the angle at the centre

c) Sum of the angles at the centre and in the complement is $180°$

d) Angles on an arc are equal

Worksheet18

1) In the figure $BDE = 40°$

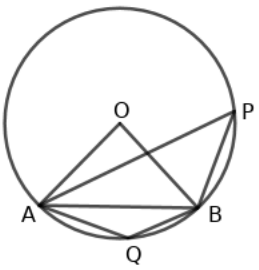


a) What is the measure of angleADB?

b) Wha is the measure of angleACB?

c) What is the measure of angle AOB?

2) Triangle OAB is an equilateral triangle



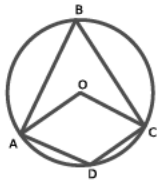
a) What is the measure of angleAOB?

b) What is the measure of angleAPB?

c) What is the measure of angleAQB?

3) Draw a circle of radus 3cm.Construct the angles 30° and 150° with vertices on the circle using compasses and scale only.

4) In the figure $\angle ABC, \angle AOC, \angle ADC$ are in an arithmetic sequence

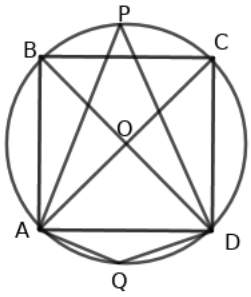


a) What is the relation between angle ABC and angle AOC

b) What is the relation between angle ABC and ADC

c) Find the measure of these angles

5) $ABCD$ is a square .The diagonals AC and BD intersect at O.



a) What is the measure of angle AOD?

b) What is the measure of angle APD?

c) What is the measure of angle AQD

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Mathematics X

Circles

20

Concepts

a) An arc of a circle can make three type of angles. Angle on the arc, angle at the centre and angle in the complement

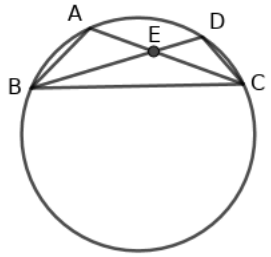
b) Angle formed by the arc in the complement is half the angle at the centre

c) Sum of the angle of an arc and its complement is $180°$

d) Angles on an arc are equal

Worksheet20

1) A, B, C, D are four points on a circle.
The chords AC, BD intersect at E.If $\angle BEC = 130°$, $\angle ECD = 20°$ then

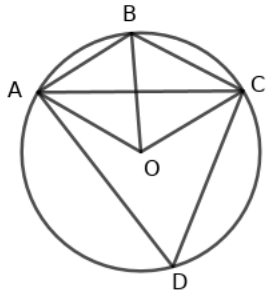


a) What is the measure of $\angle CED$?

b) What is the measure of $\angle CDE$?

c) What is the measure of $\angle BAC$?

2) O is the centre of the circle.If $\angle ACB = 20°, \angle CAB = 30°$ then



a) What is the measure of $\angle AOB$?

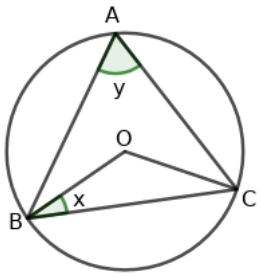
b) What is the measure of $\angle COB$?

c) What is the measure of $\angle AOC$?

d) What is the measure of $\angle ADC$?

e) What is the measure of $\angle ABC$?

3) $O$is the centre of the circumcircle of triangle ABC.
If $\angle BAC = y, \angle OBC = x$then



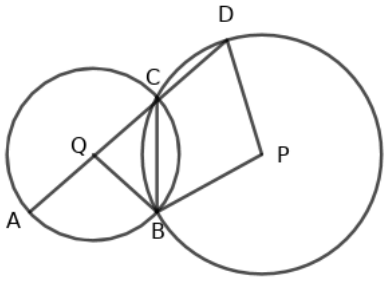
a) What is the measure of $\angle BCO$?

b) What is the measure of $\angle BOC$?

c) Prove that $x + y = 90^\circ$

4) Draw a circle of radius 3cm. Construct triangle ABCin which $\angle A = 70^\circ, \angle B = 80^\circ$ with all its vertices on the circle.

5) P and Q are the centre of the circles shown in the figure. Circles intersect at B and C.If $\angle AQB = 130^\circ$ then



a) What is the measure of $\angle ACB$?

b) What is the measure of $\angle BCD$?

c) What is the measure of $\angle BPD$

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2020-21 Academic year Works

Mathematics X

Circles

21

Concepts

a) An arc of a circle can make three type of angles. Angle on the arc, angle at the centre and angle in the complement

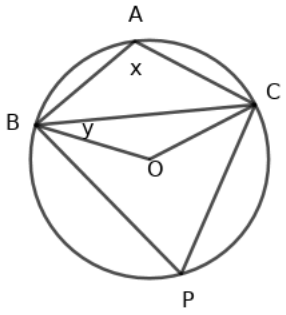
b) Angle formed by the arc in the complement is half the angle at the centre

c) Sum of the angle of an arc and its complement is $180°$

d) Angles on an arc are equal

Worksheet21

1) In the figure $\angle BAC = x, \angle CBO = y, O$



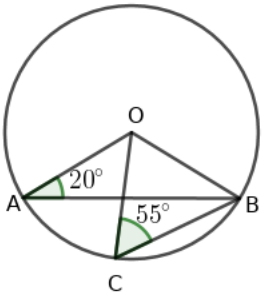
a) What is the measure of $\angle BCO$?

b) What is the measure of $\angle BOC$?

c) What is the measure of $\angle BPC$?

d) Prove that $x - y = 90°$?

2) In the figure O is the centre of the circle .If $\angle BCO = 55°, \angle BAO = 20°$ then



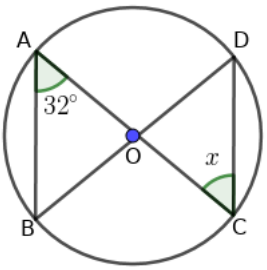
a) What is the measure of $\angle OBC$?

b) What is the measure of $\angle BOC$?

c) What is the measure of $\angle AOC$?

d) What is the measure of $\angle ABC$?

3) In the figure O is the centre of the circle.If $\angle BAC = 32°$ then

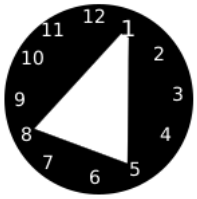


a) Find the angles of triangle OAB

b) What is the measure of $\angle DOC$?

c) Find x

4) This is the picture of a clock face.$1, 8, 5$ are joined to make a triangle.Find the angles of this triangle.



5) Angles of a triangle are in the ratio$1 : 2 : 3$. Vertices of this triangle are on a circle of radius 3cm .Construct the triangle

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2020-21 Academic year Works

Mathematics X

Circles

22

Concepts

a) If the vertices of a qudrilateral are on a circle we call it cyclic quadrilateral.

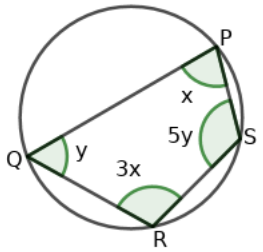
b) The sum of the opposite angles of a cyclic quadrilateral is $180°$.

c) The converse of the above statement is also true. If the sum of the opposite angles of a quadrilateral is $180°$ it will be a cyclic quadrilateral.

d) Square, rectangle and isosceles trapezium are cyclic .

Worksheet22

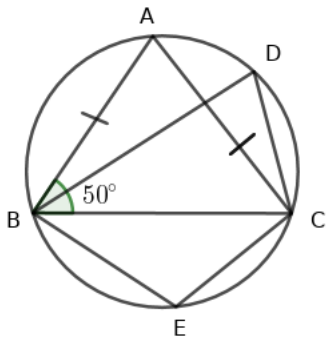
1) In the figure $PQRS$ is a cyclic quadrilateral.$\angle P = x, \angle Q = y, \angle R = 3x, \angle S = 5y$.



a) Find x and y

b) Find the angles of the quadrilateral.

2) ABC is an isosceles triangle with $AB = AC, \angle ABC = 50°$.

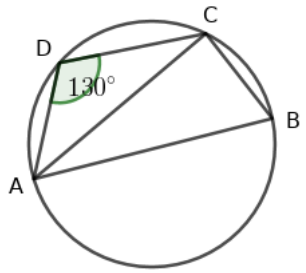


a) Name two cyclic quadrilaterals in this picture.

b) What is the measure of angle D?

c) What is the measure of $\angle BEC$?

3) $ABCD$ is a cyclic quadrilateral.AB is the diametre of the circle , $AD = CD$ and $\angle ADC = 130°$.



a) What is the measure of $\angle ACB$?

b) What is the measure of $\angle ABC$?

c) Find $\angle DCB$.

d) What is the measure of $\angle BAD$?

4) Prove that any cyclic parallelogram is a rectangle.

5) In triangle ABC, $AB = AC$.P and Q are the mid points of the side AB and AC.

a) Draw a rough diagram and join the points P and Q.

b) Prove that $BPQC$ is a cyclic quadrilateral.

c) If $\angle A$ in triangle ABC is $20°$, find the angles of the trapezium $BPQC$

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Mathematics X

Circles

23

Concepts

a) If the vertices of a qudrilateral are on a circle we call it cyclic quadrilateral.

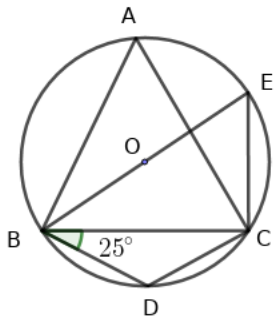
b) The sum of the opposite angles of a cyclic quadrilateral is $180°$.

c) The converse of the above statement is also true. If the sum of the opposite angles of a quadrilateral is $180°$ it will be a cyclic quadrilateral.

d) Square, rectangle and isosceles trapezium are cyclic .

Worksheet23

1 In the figure $BD = CD, \angle DBC = 25°$

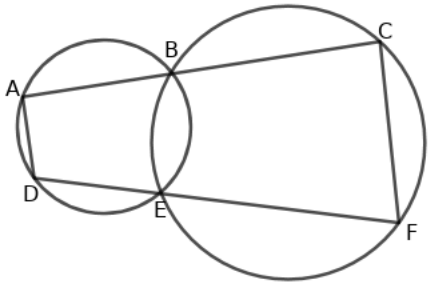


a) What is the measure of $\angle BDC$?

b) What is the measure of $\angle BAC$?

c) What is the measure of $\angle EBC$?

2) Two circles intersect at B and E as in the figure. The points $A - B - C$ are along a line. Also the points $D - E - F$ are also on a line.

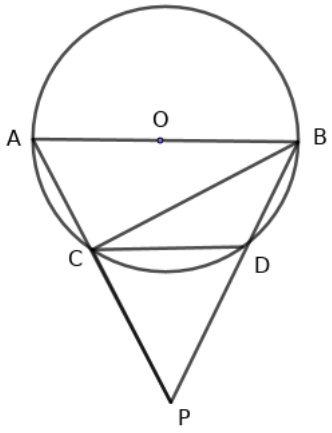


a) Prove that AD is parallel to CF

b) If $AC = DF$ suggest a suitable name to the quadrilateral $ADFC$

c) Prove that $ADFC$ is a cyclic quadrilateral.

3) AB is the diametre of the circle.CD is a chord of length equal to radius of the circle.



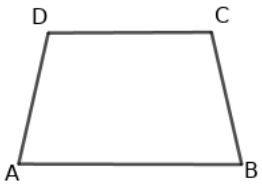
a) What is the measure of $\angle COD$?

b) What is the measure of $\angle CBD$?

c) What is the measure of $\angle DCP$?

d) Find the measure of $\angle CPD$

4) In the figure $ABCD$ is a quadrilateral in which AB is parallel to CD and $AD = BC$



Prove that $ABCD$ is a cyclic quadrilateral.

5) The angles of the quadrilateral $ABCD$ are in the ratio $1 : 2 : 3 : 4$ in an order.

a) If the smallest angle is x,what are the other angles?

b) Find the measure of all the angles of $ABCD$

c) Is $ABCD$ a cyclic quadrilateral.

d) How should the ratio numbers interchange to make this cyclic?

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2020-21 Academic year Works

Mathematics X
Circles

23

Concepts

a) If the vertices of a qudrilateral are on a circle we call it cyclic quadrilateral.

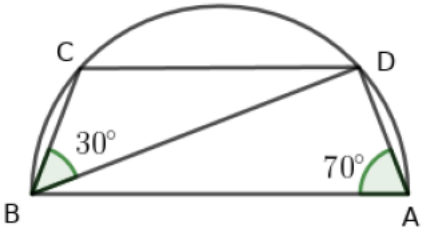
b) The sum of the opposite angles of a cyclic quadrilateral is $180°$.

c) The converse of the above statement is also true. If the sum of the opposite angles of a quadrilateral is $180°$ it will be a cyclic quadrilateral.

d) Square, rectangle and isosceles trapezium are cyclic .

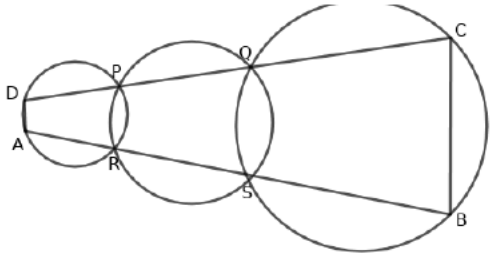
Worksheet23

1) C, D are two points in a semicircle of diametre AB.
If $\angle BAD = 70°, \angle DBC = 30°$ then



a) What is the measure of $\angle BCD$?
b) What is the measure of $\angle CDB$?
c) What is the measure of $\angle ADC$?
d) What is the measure of $\angle ABD$?

2) In the figure we can see three intersecting circles .$D - P - Q - C$are on a line .$A - R - S - B$are also on a line

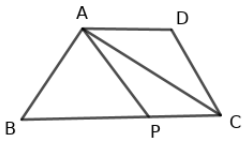


a) Prove that the quadrilateral $ABCD$is cyclic

b) If $\angle CDA = \angle DAB$ then what type of quadrilateral is $ABCD$?

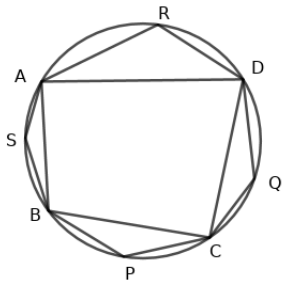
c) If $\angle CDA = \angle DAB = 40^\circ$ then find other two angles of $ABCD$

3 In traingle ABC, P is a point on BC.
$AB = AP$,the line through A parallel to BC and the line through Cparallel to AP intersect at D .Prove that $ABCD$ is cyclic



4) The parallelogram which is not a rectangle is not cyclic. Justify this statement

5) $ABCD$ is a cyclic quadrialteral. Find $\angle P + \angle Q + \angle R + \angle S$



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2020-21 Academic year Works

Mathematics X

Circles

19

Concepts

a) An arc of a circle can make three type of angles. Angle on the arc, angle at the centre and angle in the complement

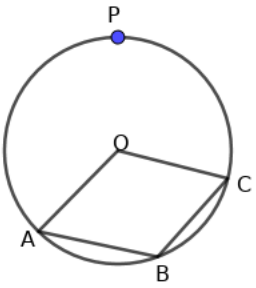
b) Angle formed by the arc in the complement is half the angle at the centre

c) Sum of the angle of an arc and its complement is $180°$

d) Angles on an arc are equal

Worksheet19

1) $OABC$ is a parallelogram.Three vertices are on a circle and one at the centre.P is a point on the circle



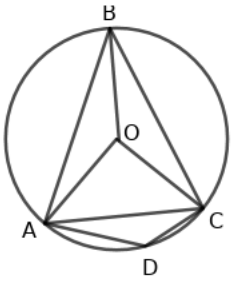
a) Draw AP and CP, mark the angle$APC = x$. What is $\angle AOC$

b) What is angle ABC?

c) Find x

d) Find the angles of the parallelogram

2) In the figure O is the centre of the circle,$\angle BAO = 20°, \angle BCO = 10°$



a) What is the measure of angleABC?

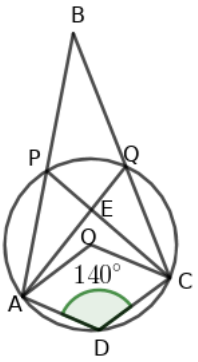
b) What is the measure of angleAOC?

c) What is the measure of angle ADC?

d) Find the angles of triangle AOC

e) If the diametre of the circle is 10cm then find the length of the chord AB

3) In the figure O is the centre of the circle.If angle $ADC = 140°$, angle $AEC = 60°$ then

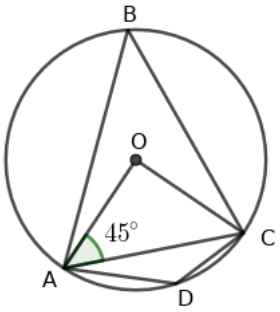


a) What is the measeure of $\angle APC$ and $\angle AQC$

b) What is the measure of angle AOC?

c) Fnd the angles of the quadrlateral $PEQB$

4) In the figure O is the centre of the circle, $\angle AOC = 45°$ then



a) What kind of triangle is OAC?

b) What is the measure of angle ABC?

c) What is the measure of angle ADC?

d) If the radius of the circle is 6cm then what is the length of the chord AC.

5) Draw a circle of radius 3cm , construct an equilateral triangle with vertices on the circle. What is the length of the side?

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Concepts

a) If the vertices of a qudrilateral are on a circle we call it cyclic quadrilateral.

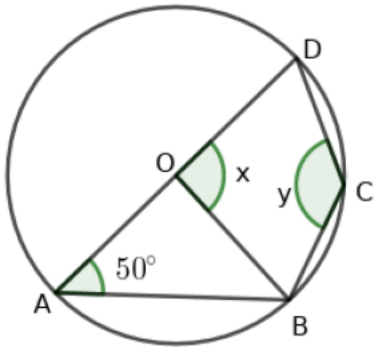
b) The sum of the opposite angles of a cyclic quadrilateral is $180°$.

c) The converse of the above statement is also true. If the sum of the opposite angles of a quadrilateral is $180°$ it will be a cyclic quadrilateral.

d) Square, rectangle and isosceles trapezium are cyclic .

Worksheet24

1) In the figure O is the centre of the circle, $\angle DAB = 50°$



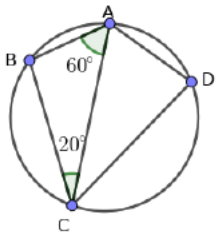
a) Find x

b) Find y

c) If $BC = CD$then what is the measure of $\angle ADC$?

d) If $BC = CD$then what is the measure of $\angle ABC$?

2) In the figure $\angle BAC = 60°$,$\angle BCA = 20°$

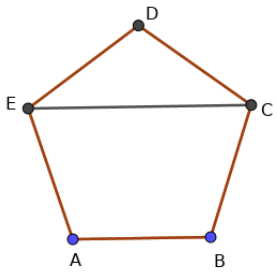


a) Looking into the figure Riswan said: $AC$is the diametre of the circle .Can you agree with his opinion? Why?

b) What is the measure $\angle ADC$

c) If $\angle DAC : \angle DCA = 3 : 1$ then find these angles.

3 In the figure $ABCDE$ is a regular pentagon.Prove that $ABCE$ is a cyclic quadrilateral.



4) Prove that the trapezium having diagonals equal is cyclic

5) $ABCD$ is a cyclic quadrilateral. If $\angle A - \angle C = 60^\circ$ then find the measure of $\angle C$.What is the measure of $\angle A$?

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Mathematics X

Circles

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Concepts

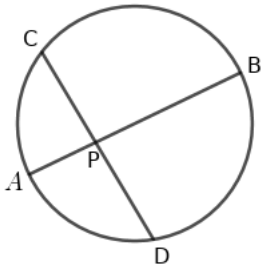
a) Two chords of a circle AB and CD intersect at the point P inside the circle .It can be proved that $PA \times PB = PC \times PD$

b) This relation can be used to construct a rectangle having equal area of another rectangle.

c) If the chords intersect outside the circle ,the same relation holds. $PA \times PB = PC \times PD$

Worksheet 25

1) In the figure two chords AB and CD intersect inside a circle at P.



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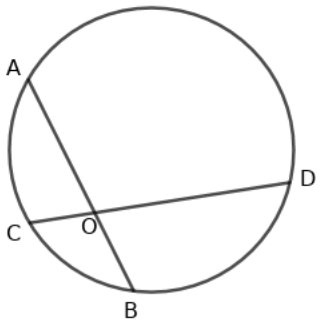
a) Join AC and BD. Establish the similarity of triangle PAC and PBD

b) What are the equal angles of these triangles

c) Prove that $PA \times PB = PC \times PD$

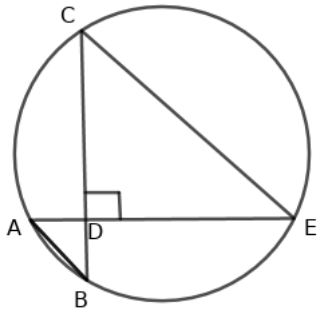
2) In the figure the chord AB has length 8cm and $OA = 5$cm.



a) What is the length of OB?

b) If$OC = 2.5$cm, what is the length of OD?

3) In the figure $AB = 5$cm, $BD = 4$cm, $CD = 9$cm.



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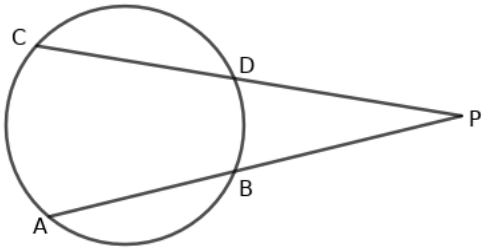
a) What is the length of AD?

b) Calculate the length of DE?

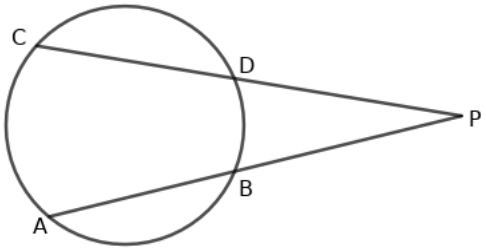
c) Is CE the diameter of the circle? why?

d) Find the length of DE

4) If AB and CD are two chords of a circle which when produced meet at a point P . If $PA = PC$ show that $AB = CD$.



5) In the figure AB and CD are two chords of a circle which when produced meet at a point P



a) Draw AC and BD , complete the quadrilateral $ABDC$

b) Establish the similarity of the triangles PAC and PDB

c) Establish the relation $PA \times PB = PC \times PD$

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Concepts

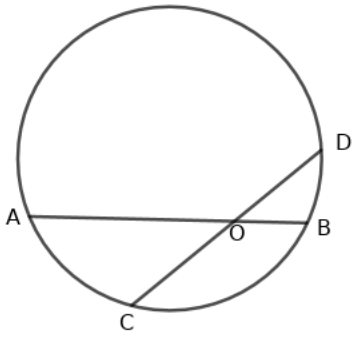
a) Two chords of a circle AB and CD intersect at the point P inside the circle .It can be proved that $PA \times PB = PC \times PD$

b) This relation can be used to construct a rectangle having equal area of another rectangle.

c) If the chords intersect outside the circle ,the same relation holds. $PA \times PB = PC \times PD$

Worksheet 25

1) The chords AB and CD intersect at O .This point divide each chord into two segments

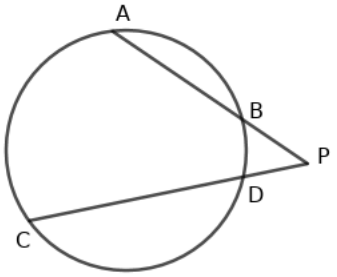


a) What is the relation between these segments?

b) If $CD = 10$cm and $OD = 4$cm then what is the length OC?

c) If $OA = 8$cm , $OC = 6$cm and $OD = 4$cm then what is the length OB?

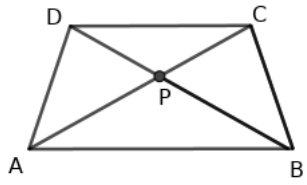
2) The chords AB and CD intersect at P inside the circle.



a) What is the relation between PA, PB, PC and PD?

b) If $AB = 5$cm , $PB = 3$cm , $PD = 2$cm then what is the length CD?

3) In the trapezium $ABCD$, $AD = BC$ and AB is parallel to CD . The diagonals AC and BD intersect at P.



a) What is the relation between $\angle ADB$ and $\angle ACB$? How can we realize this relation?

b) If $\angle DAC = 30°$ then what is the measure of $\angle DBC$?

c) What is the relation between the segments made by P on the diagonals?

4) In the quadrlateral $ABCD$, the diagonals AC and BD intersect at P. If $PA = 9$cm $PB = 12$cm, $PC = 4$cm and $PD = 3$cm then

a) Draw a rough diagram and mark the mesaurements

b) Is this a cyclic quadrilateral ? How can we realize this ?

c) If $\angle A = 40°$ and $\angle B = 70°$ find other two angles of the quadrilateral

5) Draw a rectangle of sides 4cm and 6cm . Construct another rectangle with area equal to the area of the first rectangle and one side 7cm in length.

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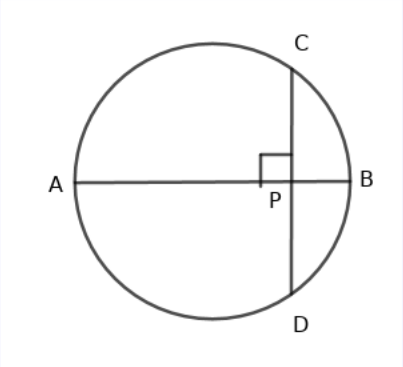
Concepts

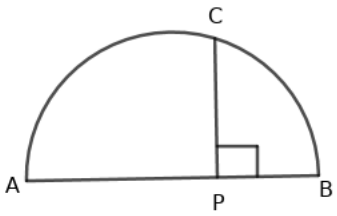


a) In the case of the intersecting chords of a circle,if one chord AB is the diametre of the circle and other chordCD is perpendicular to the diametre ,then $PA \times PB = PC^2$

b) This relation is used to construct a square with same area of a rectangle.It can be used to draw the lines of irrational lengths.

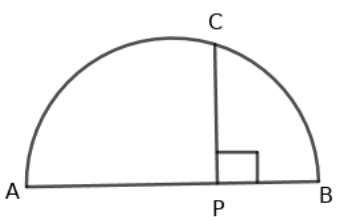
Worksheet 26

1) AB is the diametre of a semicircle, P is a point on AB and PC is perpendicular to AB



a) Prove that $PA \times PB = PC^2$
b) If$PA = 9$cm , $PB = 4$ cm then what is the length PC?
c) What is the area of the square with side PC?

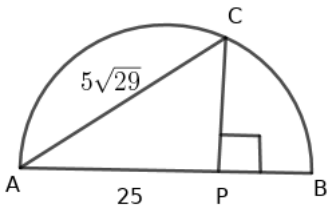
2)]AB is the diametre of a semicircle, P is a point on AB and PC is perpendicular to AB



1

a) If $PC = 6$cm,and $PB = 3$cm then what is the length of PA
b) What is the radius of the circle ?
c) What is the area of the square drawn with side PC?

3) In the figure AB is the diametre of the semicircle, PC is perpendicular to AB. $AC = 5\sqrt{29}$cm and $PA = 25$cm.



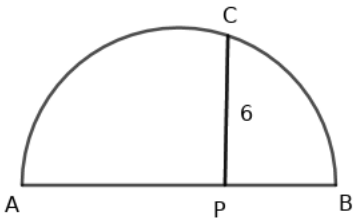
a) What is the length of PC?

b) What is the lenght PB?

c) What is the radius of the circle?

4) Draw a semicircle of suitable diametre .Construct a line of length $\sqrt{12}$cm perpendicular to the diametre whose one end is on the diameter and other end is on the semicircle.Explain the principle of construction.

5) In the figure AB is the diametre of the circle and PC is perpendicular to the diametre. $PA : PB = 2 : 1$ and $PC = 6$cm.



a) Write the relation between PA, PB and PC?

b) Find the lengths PA and PB

c) What is the radius of the circle?

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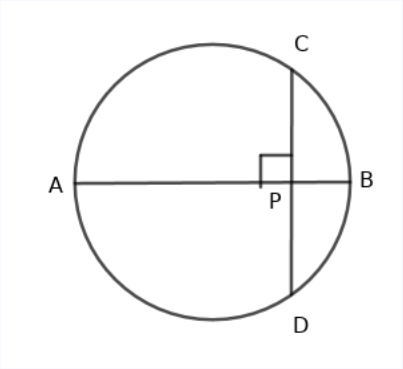
Concepts

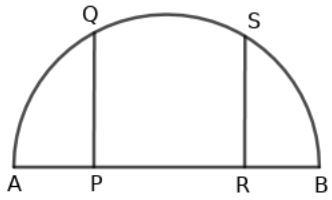


a) In the case of the intersecting chords of a circle,if one chord AB is the diametre of the circle and other chordCD is perpendicular to the diametre ,then $PA \times PB = PC^2$

b) This relation is used to construct a square with same area of a rectangle.It can be used to draw the lines of irrational lengths.

Worksheet 26

1) AB is the diametre of a semicircle.The lines $PQ$and $RS$are perpendicular to AB.If $PQ = RS$then



a) What is the relation between the lengths PA, PB and PQ ?
b) What is the relation between the lenghths AR, BR and RS
c) Prove that $PA = BR$

2) a) Draw an equilateral triangle of altitude 3 cm
b) What is the lenght of one side ?
c) What is the radius of its incircle?

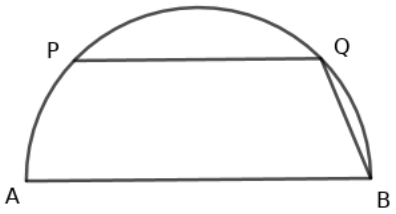
3) Draw a rectangle of sides 5cm and 3cm .Construct a square whose area is same as the area of the rectangle

4) a) Draw a semicircle of suitable diametre .Draw a line of length $\sqrt{12}$cm whose one end on AB and other end on the semicircle.

b) Draw a chord of length $\sqrt{48}$ cm by make the semicircle as the circle

5) $AB$is the diametre of a semicircle.$PQ = \sqrt{14}$cm $RS = \sqrt{18}$ cm . These lines are perpendicular to the diametre . Find the length of AB?

6) AB is the diametre of a semicircle , PQ is parallel to the diametre
If $AB = 8$cm , $BQ = 2$ cm then find the langth PQ.



7) Draw an equilateral triangle of one side $\sqrt{18}$cm

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