



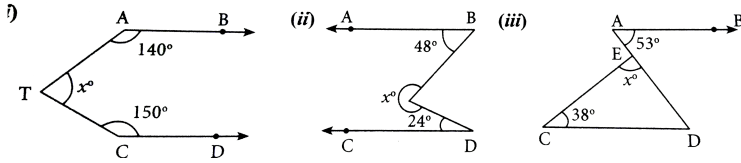
MATHS

BOOKS - SURA MATHS (TAMIL ENGLISH)

GEOMETRY

Exercise 4 1

1. In the figure, AB parallel to CD, find x.



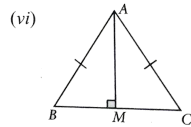
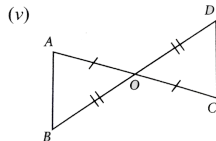
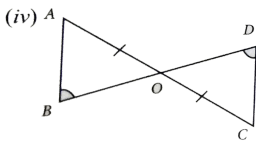
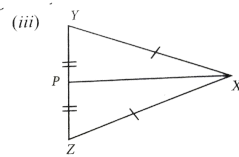
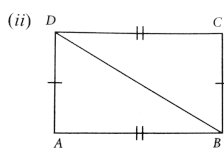
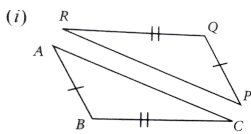
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2. The angles of a triangle are in the ratio 1:2:3, find the measure of each angles of the triangle.



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3. Consider the given pairs of triangles and say whether each pair is that of congruent triangles. If the triangles are congruent, say 'how', if they are not congruent say 'why' and also say if a small modification would them congruent :



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4. $\triangle ABC$ and $\triangle DEF$ are two triangles in which $AB=DF$,
 $\angle ACB = 70^\circ$, $\angle ABC = 60^\circ$, $\angle DEF = 70^\circ$
and $\angle EDF = 60^\circ$. Prove that the triangles
are congruent.



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Exercise 4 2

1. The angles of a quadrilateral are in the ratio 2:4:5:7. Find all the angles.



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2. In a quadrilateral ABCD, $\angle A = 72^\circ$ and $\angle C$ is the supplementary of $\angle A$. The other two angles are $2x - 10$ and $x + 4$. Find the value of x and the measure of all the angles.



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3. ABCD is a rectangle whose diagonals AC and BD intersect at O. If $\angle OAB = 46^\circ$, find $\angle OBC$.



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4. The lengths of the diagonals of a Rhombus are 12 cm and 16 cm. Find the side of the rhombus.



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5. Show that the bisectors of angles of a parallelogram form a rectangle.



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6. If a triangle and a parallelogram lie on the same base and between the same parallels, then prove that the area of the triangle is equal to half of the area of parallelogram.



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7. In the figure $\angle A = 64^\circ$, $\angle ABC = 58^\circ$. If BO and CO are the bisectors of $\angle ABC$ and $\angle ACB$ respectively of $\triangle ABC$, find x° and y° .



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8. In the given figure, ABCD is a rectangle and EFGH is a parallelogram. Using the measurements given in the figure, what is the

length "d" of the segment that is perpendicular to \overline{HE} and \overline{FG} ?



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Exercise 4 3

1. The diameter of the circle is 52 cm and the length of one its chord is 20 cm. Find the distance of the chord from the centre.



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2. The chord of length 30 cm is drawn at the distance of 8 cm from the centre of the circle
Find the radius of the circle.



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3. Find the length of the chord AC where AB
CD are the diameters perpendicular to each
other of a circle with radius $4\sqrt{2}$ cm and also
find $\angle OAC$ and $\angle OCA$



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4. A chord is 12 cm away from the centre of the circle of radius 15cm. Find the length of the chord.



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5. In a circle, AB and CD are two parallel chords with centre O and radius 10 cm such that $AB=16$ cm and $CD= 12$ cm determine the distance between the two chords?



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6. Two circles of radii 5 cm and 3 cm intersect at two points and the distance between their centres is 4 cm. Find the length of the common chord.



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7. In the given figure, $\angle CAB = 25^\circ$, find $\angle BDC$, $\angle DBA$ and $\angle COB$.

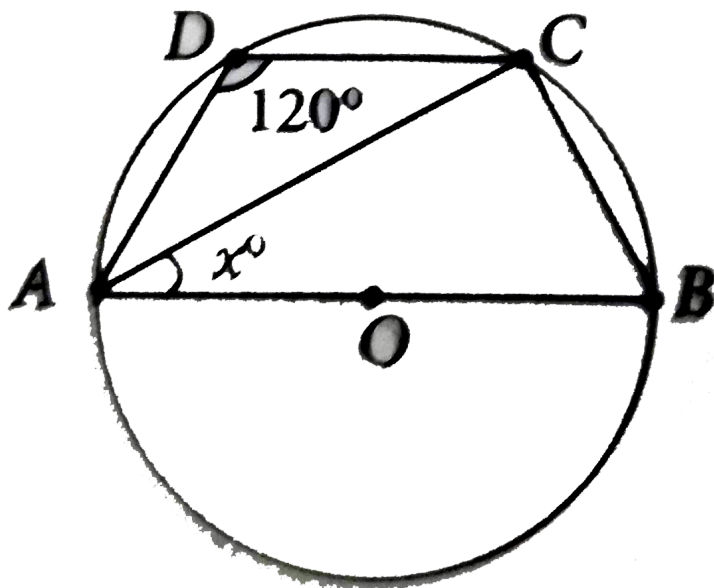




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Exercise 4 4

1. Find the value of x in the given figure.



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2. In the given figure, AC is the diameter of the circle with center O . If $\angle ADE = 30^\circ$, $\angle DAC = 35^\circ$ and $\angle CAB = 40^\circ$.

Find (i) $\angle ACD$, (ii) $\angle ACB$, (iii) $\angle DAE$



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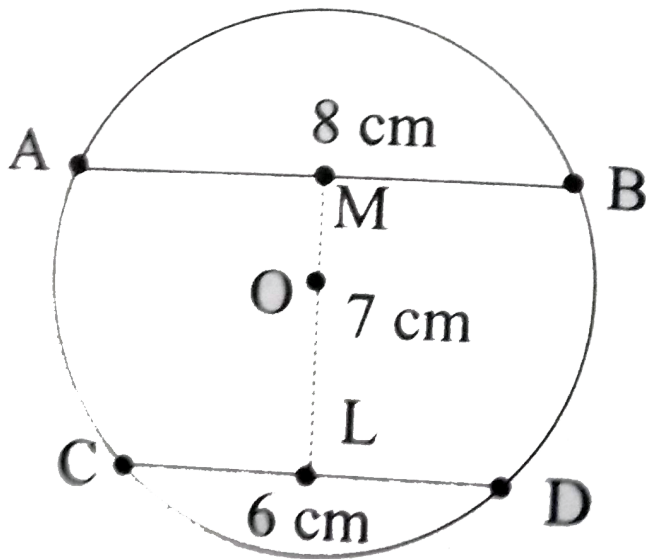
3. Find all the angles of the given cycle quadrilateral $ABCD$ in the figure.



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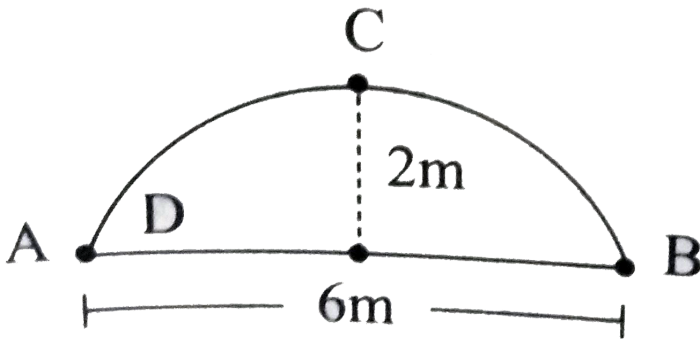
4. In the given figure, AB and CD are the parallel chords of a circle with centre O . Such that $AB = 8$ cm and $CD = 6$ cm. If $OM \perp AB$ and $OL \perp CD$ distance between LM is 7 cm.

Find the radius of the circle ?



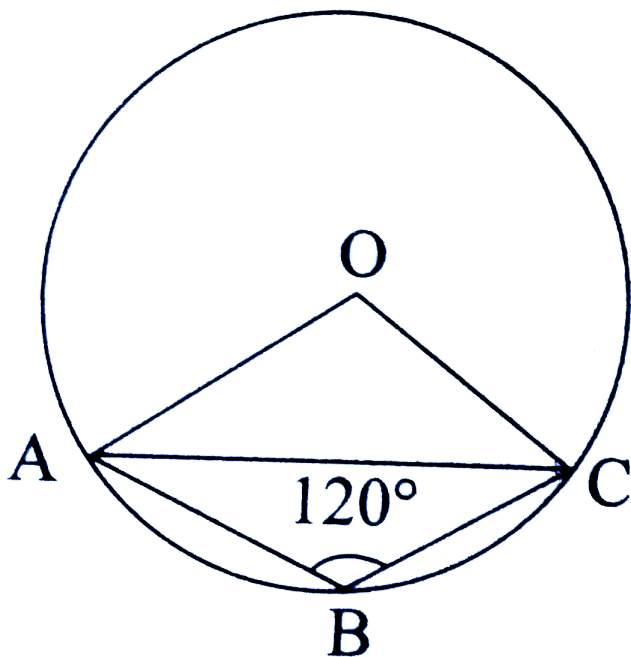
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5. The arch of a bridge has dimensions as shown, where the arch measure 2 m at its highest point and width is 6 m. What is the radius of the circle that contains the arch ?



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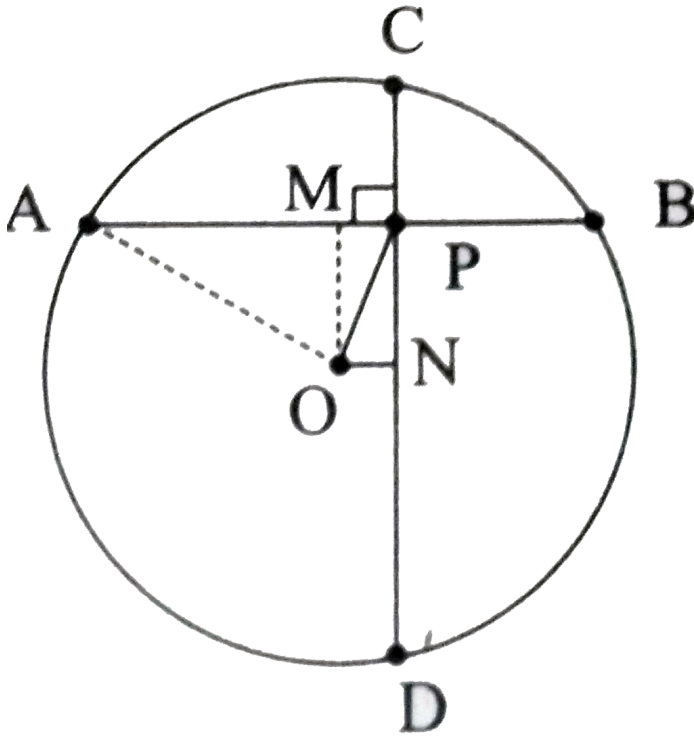
6. In figure $\angle ABC = 120^\circ$, where A,B and C are points on the circle with centre O. Find $\angle OAC$?



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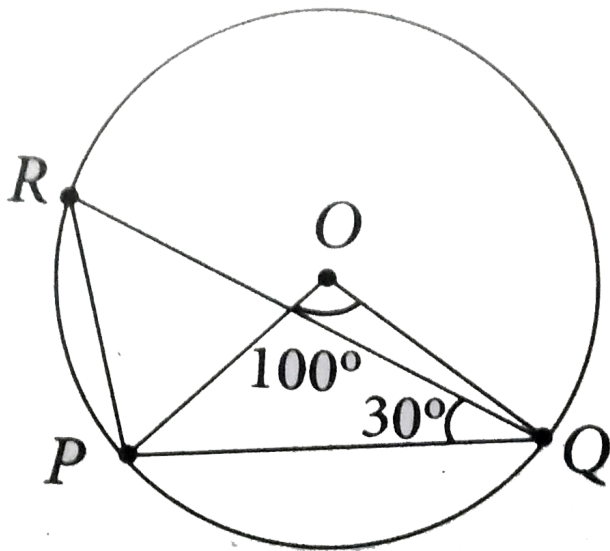
7. A school wants to conduct tree plantation programme. For this a teacher allotted a circle of radius 6m ground to ninth standard students for planting sapplings. Four students plant trees at the points A,B,C and D as shown in figure. Here $AB = 8\text{m}$, $CD = 10\text{ m}$ and $AB \perp CD$. If another student places a flower pot at the point P, the intersection of AB and

CD, then find the distance from the centre to P.



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8. In the given figure, $\angle POQ = 100^\circ$ and $\angle PQR = 30^\circ$, then find $\angle RPO$.



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Exercise 4 5

1. Construct the $\triangle LMN$ such that $LM = 7.5$ cm, $MN = 5$ cm and $LN = 8$ cm. Locate its

centroid.



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2. Draw and locate the centroid of the triangle ABC where right angle at A, $AB = 4$ cm and $AC = 3$ cm.



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3. Draw the $\triangle ABC$, where $AB = 6$ cm, $B = 110^\circ$ and $AC = 9$ cm and construct the

centroid.



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4. Construct the $\triangle PQR$ such that $PQ = 5\text{cm}$, $PR = 6\text{cm}$ and $\angle QPR = 60^\circ$ and locate its centroid.



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5. Draw $\triangle PQR$ with sides $PQ = 7\text{ cm}$, $QR = 8\text{ cm}$ and $PR = 5\text{cm}$ and construct its

Orthocentre.



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6. Draw an equilibrium triangle of sides 6.5 cm and locate its Orthocentre.



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7. Draw $\triangle ABC$, where $AB = 6\text{cm}$, $\angle B = 110^\circ$ and $BC = 5\text{ cm}$ and construct its Orthocentre.



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8. Draw and locate the Orthocentre of a right triangle PQR where $PQ = 4.5$ cm, $QR = 6$ cm and $PR = 7.5$ cm.



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Exercise 4 6

1. Draw a triangle ABC, where $AB = 8$ cm, $BC = 6$ cm and $\angle B = 70^\circ$ and locate its

circumcentre and draw the circumcircle.



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2. Construct the right triangle PQR whose perpendicular sides are 4.5 cm and 6 cm. Also locate its circumcenter and draw the circumcircle.



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3. Construct $\triangle ABC$ with $AB = 5$ cm
 $\angle B = 100^\circ$ and $BC = 6$ cm. Also locate its
circumcentre draw circumcircle.



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4. Construct an isosceles triangle PQR where
 $PQ = PR$ and $\angle Q = 50^\circ$, $QR = 7$ cm. Also draw
its circumcircle.



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5. Draw an equilateral triangle of side 6.5 cm and locate its incentre. Also draw the incircle.



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6. Draw a right triangle whose hypotenuse is 10 cm and one of the legs is 8 cm. Locate its incenter and also draw the incircle.



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7. Draw $\triangle ABC$ given $AB = 9$ cm, $\angle CAB = 115^\circ$ and $\angle ABC = 40^\circ$. Locate its incenter and also draw the incircle.



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8. Construct $\triangle ABC$, in which $AB = BC = 6$ cm and $\angle B = 80^\circ$. Locate its incenter and draw the incircle.



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Exercise 4 7

1. The exterior angle of a triangle is equal to the sum of two

- A. Exterior angles
- B. Interior opposite angles
- C. Alternate angles
- D. Interior angles

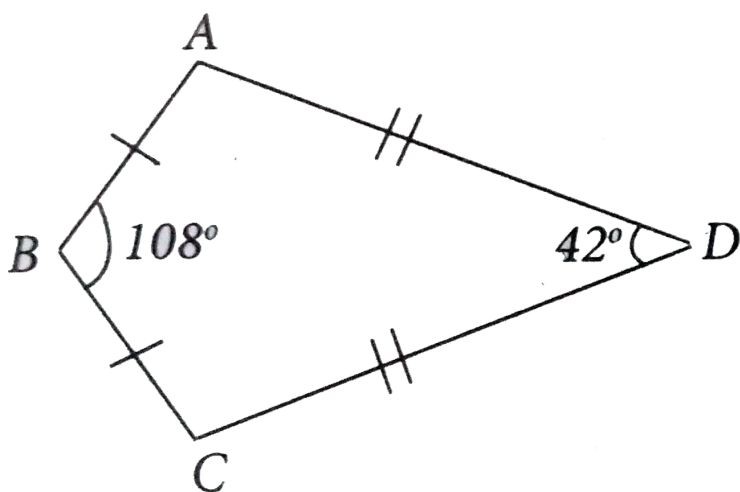
Answer: B



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2. In the quadrilateral ABCD, $AB=BC$ and $AD=DC$

Measure of $\angle BCD$ is



A. 150°

B. 30°

C. 105°

D. 72°

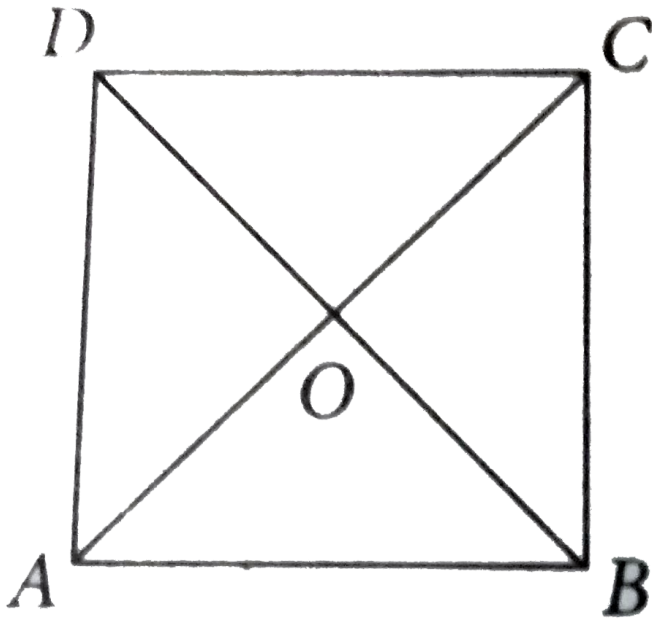
Answer: C



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3. ABCD is a square, diagonals AC and BD meet at O. The number of pairs of congruent

triangles with vertex O are



A. 6

B. 8

C. 4

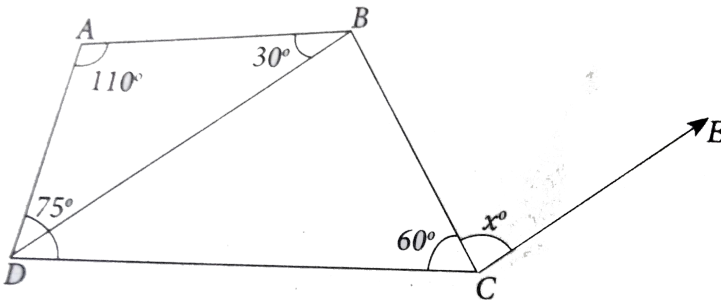
D. 12

Answer: A



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4. In the given figure $CE \parallel DB$ then value of x° is



A. 45°

B. 30°

C. 75°

D. 85°

Answer: D



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5. If the diagonal of a rhombus are equal, then the rhombus is a

A. Parallelogram but not a rectangle

B. Rectangle but not a square

C. Square

D. Parallelogram but not a square

Answer: C



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6. If bisectors of $\angle A$ and $\angle B$ of a quadrilateral ABCD meet at O, then $\angle AOB$ is

A. $\angle C + \angle D$

B. $\frac{1}{2}(\angle C + \angle D)$

C. $\frac{1}{2}\angle C + \frac{1}{3}\angle D$

D. $\frac{1}{3}\angle C + \frac{1}{2}\angle D$

Answer: B



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7. The interior angle made by the side in a parallelogram is 90° then the parallelogram is

a

A. rhombus

B. rectangle

C. trapezium

D. Kite

Answer: B



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8. Which of the following statement is correct?

A. Opposite angles of a parallelogram are not equal

B. Adjacent angles of a parallelogram are complementary

C. Diagonals of a parallelogram are always equal

D. Both pairs of opposite side of a parallelogram are always equal.

Answer: D



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9. The angles of the triangles are $3x-40$, $x+20$ and $2x-10$ then the value of x is

A. 40

B. 35

C. 50

D. 45

Answer: B



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10. PQ and RS are two equal chords of a circle with centre O such that $\angle POQ = 70^\circ$, then $\angle ROS =$

A. 60°

B. 70°

C. 55°

D. 80°

Answer: C



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11. A chord is at a distance of 15 cm from the center of the circle of radius 25 cm. The length of the chord is

A. 25 cm

B. 20 cm

C. 40 cm

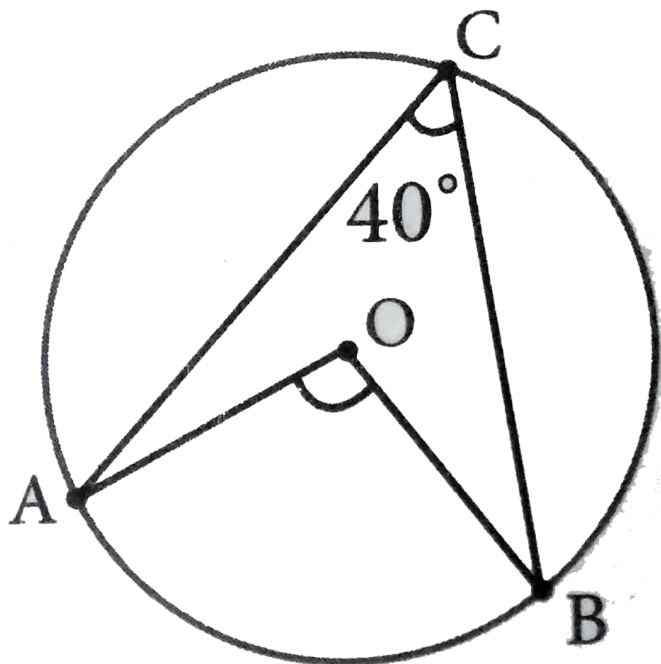
D. 18 cm

Answer: C



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12. In the figure, O is the centre of the circle and $\angle ACB = 40^\circ$ then $\angle AOB = \dots\dots\dots$



A. 80°

B. 85°

C. 70°

D. 65°

Answer: A



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13. In a cyclic quadrilaterals ABCD,

$\angle A = 4x$, $\angle C = 2x$ the value of x is

A. 30°

B. 20°

C. 15°

D. 25°

Answer: A



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14. In the figure, O is the centre of a circle and diameter AB bisects the chord CD at a point E such that $CE = ED = 8$ cm and $EB = 4$ cm. The radius of the circle is

A. 8 cm

B. 4 cm

C. 6 cm

D. 10 cm

Answer: D



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15. If one angle of a cyclic quadrilateral is 75° , then the opposite angle is

A. 100°

B. 105°

C. 85°

D. 90°

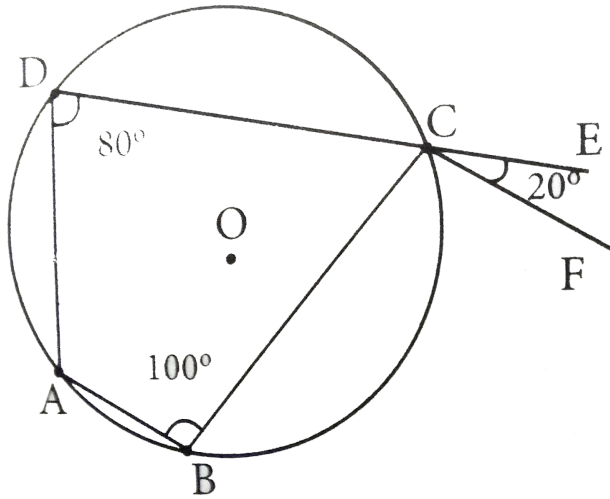
Answer: B



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16. In the figure, ABCD is a cyclic quadrilateral in which DC produced to E and CF is drawn parallel to AB such that $\angle ADC = 80^\circ$ and

$\angle ECF = 20^\circ$, then $\angle BAD = ?$



A. 100°

B. 20°

C. 120°

D. 110°

Answer: C



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17. AD is a diameter of a circle and AB is a chord. If $AD = 30$ cm and $AB = 24$ cm then the distance of AB from the centre of the circle is

A. 10 cm

B. 6 cm

C. 7 cm

D. 9 cm

Answer: B



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18. In the given figure, If $OP = 17$ cm $PQ = 30$ cm and OS is perpendicular to PQ , then RS is

A. 10 cm

B. 6 cm

C. 7 cm

D. 9 cm

Answer: D



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Additional Questions And Answers Exercise 4 1

1. Find the complement of a each of the following angles

(i) 63° , (ii) 24° , (iii) 48°



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2. Find the supplement of each of the following angles

(i) 58° , (ii) 148° , (iii) 120°



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Additional Questions And Answers Exercise 4 2

1. If the measures of three angles of a quadrilateral are 100° , 84° and 76° then, find the measure of fourth angle.



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2. In the parallelogram ABCD if $\angle A = 65^\circ$, find $\angle B$, $\angle C$ and $\angle D$.



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3. If ABCD is a rhombus and if $\angle A = 76^\circ$, find $\angle CDB$.



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4. Prove: In a parallelogram, opposite sides are equal.



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5. The angles of a quadrilateral are in the ratio 1 : 2 : 3 : 4. Find all the angles.



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Additional Questions And Answers Exercise 4 3

1. The radius of a circle 15 cm and the length of one of its chord is 24 cm. Find the distance of the chord from the centre.



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2. The chord of length 32 cm is drawn at the distance of 12 cm from the centre of the circle. Find the radius of the circle.



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3. In a circle, AB and CD are two parallel chords with centre O and radius 5 cm such that AB = 8 cm and CD = 6 cm determine the distance between the chords?



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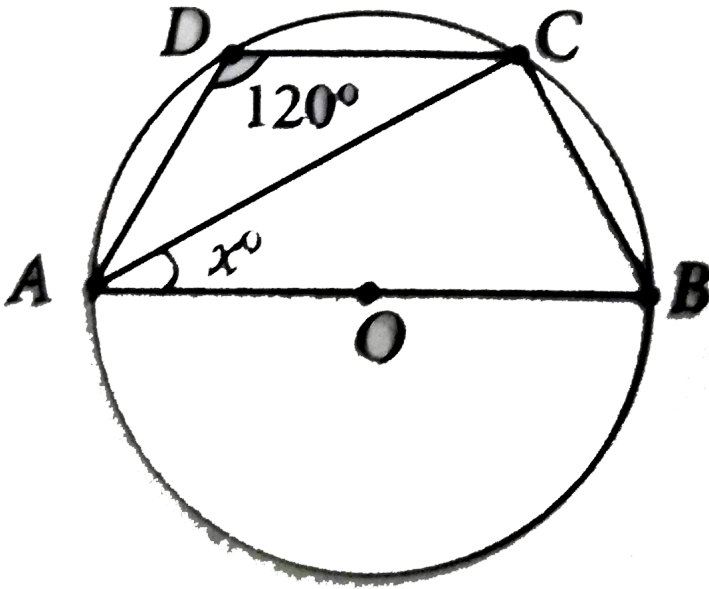
4. Find the value of x



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Additional Questions And Answers Exercise 4 4

1. Find the value of x in the given figure.



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2. Find all the angles of the given cyclic quadrilateral ABCD in the figure.



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3. AB and CD are two parallel sides of a cyclic quadrilateral ABCD such that $AB = 12$ cm, $CD = 16$ cm and the radius of the circle is 10 cm. Find the shortest distances between the two sides

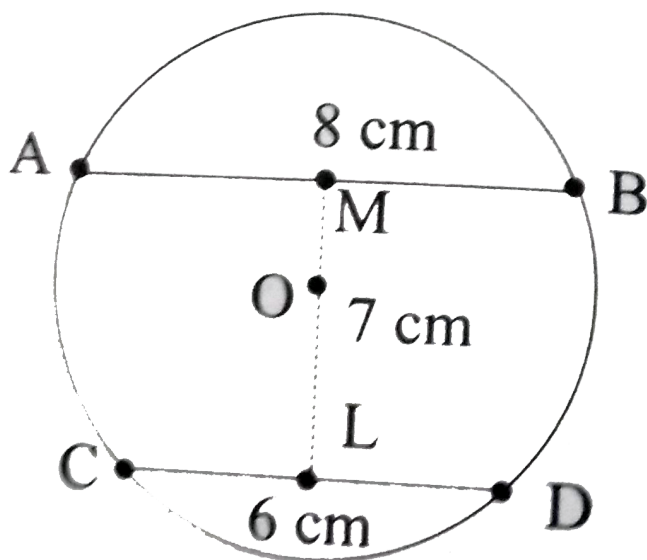
AB and CD.



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4. In the given figure, AB and CD are the parallel chords of a circle with centre O. Such that $AB = 8$ cm and $CD = 6$ cm. If $OM \perp AB$ and $OL \perp CD$ distance between LM is 7 cm.

Find the radius of the circle ?



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1. Construct an equilateral triangle of sides 6 cm and locate its orthocentre.



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2. Draw and locate the orthocentre of a right triangle PQR right angled at Q, with $PQ = 4.5$ cm and $QR = 6$ cm.



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3. Construct the circumcentre of the $\triangle ABC$ with $AB = 5 \text{ cm}$, $\angle A = 60^\circ$ and $\angle B = 80^\circ$, also draw two circumcircle and find the circum radius of the $\triangle ABC$.



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Additional Questions And Answers Exercise 4 6

1. Draw the circumcircle for an equilateral triangle of side 6 cm.



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2. Construct the centroid of $\triangle PQR$ such that $PQ = 9\text{cm}$, $PQ = 7\text{ cm}$, $RP = 8\text{ cm}$.



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3. Draw and locate the centroid of the triangle ABC where right angle at A, $AB = 8\text{ cm}$ and $AC = 6\text{ cm}$.



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4. Construct the centroid of $\triangle PQR$ whose sides are $PQ = 8$ cm, $QR = 6$ cm, $RP = 7$ cm.



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Exercise 4 7 Multiple Choice Questions

1. If an angle is equal to one third of its supplement, its measure is equal to

A. 40°

B. 50°

C. 45°

D. 55°

Answer: C



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2. The complement of an angle exceeds the angle by 60° . Then the angle is equal to

A. 25°

B. 30°

C. 15°

D. 35°

Answer: C



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3. ABCD is a parallelogram, E is the mid-point of AB and CE bisects $\angle BCD$. Then $\angle DEC$ is

A. 60°

B. 90°

C. 100°

D. 120°

Answer: B



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4. If the length of a chord decreases, then its distance from the centre _____

A. increases

B. decreases

C. same

D. cannot say

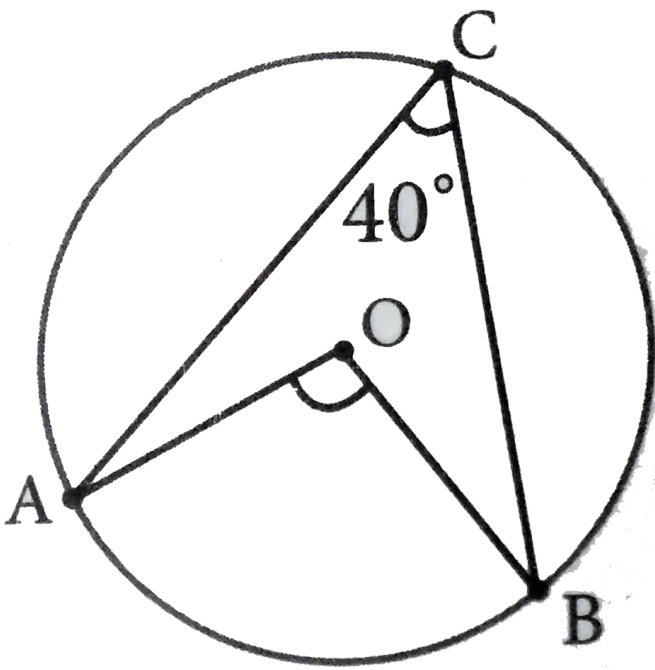
Answer: A



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5. In the figure, O is the centre of the circle and

$\angle ACB = 40^\circ$ then $\angle AOB = \dots\dots\dots$



A. 60°

B. 90°

C. 120°

D. 180°

Answer: C



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6. The angle subtend by a semicircle at the centre is _____.

A. 60°

B. 90°

C. 120°

D. 180°

Answer: D



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7. The angle subtended by a semicircle at the remaining part of the circumference is _____.

A. 60°

B. 90°

C. 120°

D. 180°

Answer: B



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Unit Test Section A

1. The exterior angle of a triangle is equal to the sum of two

- A. Exterior angles
- B. Interior opposite angles
- C. Alternate angles

D. Interior angles

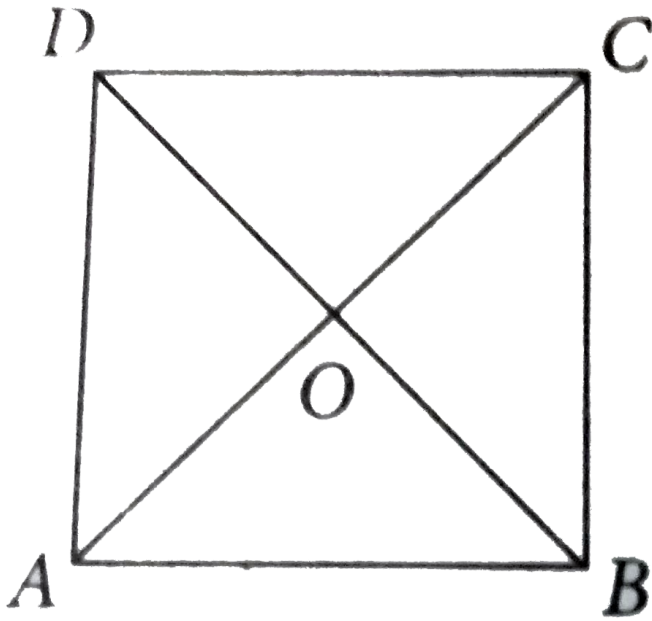
Answer: B



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2. ABCD is a square, diagonals AC and BD meet at O. The number of pairs of congruent

triangles with vertex O are



A. 6

B. 8

C. 4

D. 12

Answer: A



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3. If bisectors of $\angle A$ and $\angle B$ of a quadrilateral ABCD meet at O, then $\angle AOB$ is

A. $\angle C + \angle D$

B. $\frac{1}{2}(\angle C + \angle D)$

C. $\frac{1}{2}\angle C + \frac{1}{3}\angle D$

D. $\frac{1}{3}\angle C + \frac{1}{2}\angle D$

Answer: B



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4. If one angle of a cyclic quadrilateral is 75° , then the opposite angle is

A. 100°

B. 105°

C. 85°

D. 90°

Answer: B



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5. AD is a diameter of a circle and AB is a chord. If AD= 30 cm and AB = 24 cm then the distance of AB from the centre of the circle is

A. 10 cm

B. 6 cm

C. 7 cm

D. 9 cm

Answer: B



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Unit Test Section B

1. The angles of a triangle are in the ratio 1:2:3, find the measure of each angles of the triangle.



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2. ABCD is a rectangle whose diagonals AC and BD intersect at O. If $\angle OAB = 46^\circ$, find $\angle OBC$.



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3. The angles of a quadrilateral are in the ratio 2:4:5:7. Find all the angles.



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4. In the given figure, AC is the diameter of the circle with center O . If $\angle ADE = 30^\circ$, $\angle DAC = 35^\circ$ and $\angle CAB = 40^\circ$.

Find (i) $\angle ACD$, (ii) $\angle ACB$, (iii) $\angle DAE$



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5. Draw a triangle ABC , where $AB = 8\text{cm}$, $BC = 6\text{cm}$ and $\angle B = 70^\circ$ and locate its

circumcentre and draw the circumcircle.



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Unit Test Section C

1. In the given figure, $ABCD$ is a cyclic quadrilateral where diagonals intersect at P such that $\angle DBC = 40^\circ$ and $\angle BAC = 60^\circ$
find (i) $\angle CAD$ (ii) $\angle BCD$



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2. If a triangle and a parallelogram lie on the same base and between the same parallels, then prove that the area of the triangle is equal to half of the area of parallelogram.



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3. Draw a triangle ABC, where $AB = 8\text{cm}$, $BC = 6\text{cm}$ and $\angle B = 70^\circ$ and locate its circumcentre and draw the circumcircle.



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4. Draw the $\triangle ABC$, where $AB = 6\text{cm}$, $B = 110^\circ$ and $AC = 9\text{ cm}$ and construct the centroid.



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