RS Aggarwal Solutions for Class 10 Maths Chapter 12 Exercise 12.2: RS Aggarwal Solutions for Class 10 Maths Chapter 12 Exercise 12.2 The Physics Wallah academic team is responsible for preparing the Chapter 12 Area Related to Circles. We have RS answers ready for each of this chapter's exercises.

Here are the detailed answers to every question found in the RS Aggarwal Solutions for Class 10 Maths Chapter 12 Exercise 12.2. You are now familiar with the chapter's formula. Physics Wallah has produced detailed notes, extra problems, and brief explanations of each maths formula for class 10 maths.

RS Aggarwal Solutions for Class 10 Maths Chapter 12 Exercise 12.2 serve as a valuable resource for students aiming to strengthen their grasp of circle-related topics, ensuring comprehensive preparation for exams and enhancing mathematical proficiency.

RS Aggarwal Solutions for Class 10 Maths Chapter 12 Exercise 12.2 Circles Overview

RS Aggarwal Solutions for Class 10 Maths Chapter 12 Exercise 12.2 focus on circles, providing clear and structured solutions to a variety of problems. This exercise covers topics such as tangents, secants, angles subtended by chords, and more.

The solutions offer step-by-step explanations, helping students understand the concepts and apply formulas effectively. They serve as a comprehensive resource for exam preparation, enabling students to practice and self-assess their understanding of circle-related mathematics, thereby enhancing their problem-solving skills and confidence.

What are Circles?

A circle in mathematics or geometry is a particular sort of ellipse when the two foci coincide and the eccentricity is zero. Another way to describe a circle is as the locus of the points drawn equally apart from the centre. The radius of a circle is the distance between its centre and its outer line. In addition to being equal to twice the radius, the diameter is the line that splits a circle in half.

A circle’s radius is used to measure this fundamental 2D form. The plane is divided into internal and exterior parts by the circles. That is comparable to that kind of line segment. Consider that the line segment is bent till the ends come together. Until the loop is exactly round, arrange it as desired.

A two-dimensional figure with an area and perimeter is a circle. The circumference, or the distance around the circle, is another name for the perimeter. The region enclosed by a circle in a two-dimensional plane is its area. Let’s go over the definition of circles, formulae, and key words in depth with examples.

RS Aggarwal Solutions for Class 10 Maths Chapter 12 Exercise 12.2

Below we have provided RS Aggarwal Solutions for Class 10 Maths Chapter 12 Exercise 12.2 Circles for the ease of the students –

> **Q.** In the given figure, PQ is a diameter of a circle with centre O. If
>
> $\angle PQR = 65^o, \angle SPR = 40^o$ and $\angle PQM = 50^o$, find $\angle QPR, \angle QPM$ and $\angle PRS$.

Solution

In $\triangle PQR$

We know that PQ is the diameter

So we get

$\angle PRQ = 90^o$ as the angle in a semicircle is a right angle

Using the angle sum property

$\angle QPR + \angle PRQ + \angle PQR = 180^o$

By substituting the values

$\angle QPR + 90^o + 65^o = 180^o$

further calculation

$\angle QPR = 180^o - 90^o - 65^o$

By subtraction

$\angle QPR = 180^o - 155^o$

So we get

$\angle QPR = 25^o$

In $\triangle PQM$

We know that PQ is the diameter

So we get

$\angle PMQ = 90^o$ as the angle in a semicircle is a right angle

Using the angle sum property

$\angle QPR + \angle RPS + \angle PRQ + \angle PRQ = 180^o$

By substituting the values

$25^o + 40^o + 90^o + \angle PRS = 180^o$

On further calculation

$\angle PRS = 180^o - 25^o - 40^o - 90^o$

By subtraction

$PRS = 180^o - 155^o$

So we get

$\angle PRS = 25^o$

Q. In the given figure, O is the centre of a circle in which $\angle OAB = 20^o$ and $\angle OCB = 55^o$. Find

$\angle BOC$

Solution

We know that $OB = OC$ which is the radius

The base angles of an isosceles triangle are equal

So we get

$\angle OBC = \angle OCB = 55^o$

In $\triangle BOC$

Using the angle sum property

$\angle BOC + \angle OCB + \angle OBC = 180^o$

By substituting values

$\angle BOC + 55^o + 55^o = 180^o$

By substituting values

$$\angle BOC + 55^o + 55^o = 180^o$$

On further calculation

$$\angle BOC = 180^o - 110^o$$

So we get

$$\angle BOC = 70^o$$

Q. In the given figure, AB and CD are straight lines through the

centre O of a circle. If $\angle AOC = 80^o$ and $\angle CDE = 40^o$, find $\angle ABC$

Solution

We know that $\angle AOC$ and $\angle BOC$ from a linear pair

It can be written as

$\angle BOC = 180^o - 80^o$

By subtraction

$\angle BOC = 100^o$

Using the angle sum property

$\angle ABC + \angle BOC + \angle DCE = 180^o$

By substituting the values

$\angle ABC + 100^o + 50^o + = 180^o$

On further calculation

$$\angle ABC = 180^o - 100^o - 50^o$$

By subtraction

$$\angle ABC = 180^o - 150^o$$

So we get

$$\angle ABC = 30^o$$

Q. In the given figure, O is the centre of the circle. If $\angle PBC = 25^o$ and $\angle APB = 110^o$, find the value of $\angle ADB$.

Solution

We know that $\angle ACB = \angle PCB$

In $\triangle PCB$

Using the angle sum property

$$\angle PCB + \angle BPC + \angle PBC = 180^o$$

We know that $\angle APB$ and $\angle BPC$ are linear pair

By substituting the values

$$\angle PCB + (180^o - 110^o) + 25^o = 180^o$$

On further calculation

$\angle PBC + 70^o + 25^o = 180^o$

$\angle PCB + 95^o = 180^o$

By subtraction

$\angle PCB = 180^o - 95^o$

So we get

$\angle PCB = 85^o$

We know that the angles in the same segment of a circle equal

$\angle ADB = \angle ACB = 85^o$

Therefore, the value of $\angle ADB$ is 85^o

Q. In the given figure, O is the centre of a circle in which $\angle OAB = 20^o$ and $\angle OCB = 55^o$. Find

$\angle AOC$

ution

know that $OA = OB$ which is the radius

The base angles of an isosceles triangle are equal

So we get

$\angle OBA = \angle OAB = 20^o$

In $\triangle AOB$

Using the angle sum property

$\angle AOB + \angle OAB + \angle OBA = 180^o$

By substituting values

$\angle AOB + 20^o + 20^o = 180^o$

further calculation

By subtraction

$$\angle AOB = 180^o - 40^o$$

So we get

$$\angle AOB = 140^o$$

We know that

$$\angle AOC = \angle AOB - \angle BOC$$

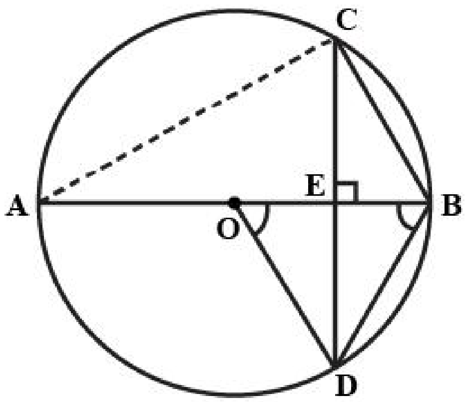
By substituting the values

$$\angle AOC = 140^o - 70^o$$

So we get

$$\angle AOC = 70^o$$

Q. In the given figure, O is the centre of the circle, BD = OD and CD⊥AB. Find ∠CAB.



Solution

Given: $BD = OD$, $CD \perp AB$

We know that, $OB = OD$ (radius of circle)

Given that, $BD = OD$

Therefore $\triangle OBD$ is an equilateral $\triangle$.

$\therefore \angle OBD = 60^\circ$

In $\triangle BED$,

$\angle BED = 90^\circ$ ($\because CD \perp AB$)

$\angle EBD = 60^\circ$ (above)

Therefore, $\angle BDE = 180^\circ - (90^\circ + 60^\circ)$

$= 30^\circ$

In $\triangle ACE$,

$\angle CAB + \angle AEC + \angle ACE = 180^\circ$ ($\because \angle CAE = \angle CAB$)

$\angle CAB + 90^\circ + 60^\circ = 180^\circ$ ($\angle ACB = 90^\circ$ $\therefore \angle ACE = 90^\circ - 30^\circ = 60^\circ$)

$\angle CAB = 180^\circ - 150^\circ$

$= 30^\circ$ Ans

Q. In the adjoining figure, O is the centre of a circle. Chord CD is parallel to diameter AB. If

$\angle ABC = 25^o$, calculate $\angle CED$.

Solution

We know that $\angle BCD$ and $\angle ABC$ are alternate interior angles

$\angle BCD = \angle ABC = 25^o$

We know that the angle subtended by an arc of a circle at the center is double the angle subtended by the arc at any point on the circumference

$\angle BOD = 2\angle BCD$

It is given that $\angle BCD = 25^o$

$\angle BOD = 2(25^o)$

By multiplication

$\angle BOD = 50^o$

In the same way

$\angle AOC = 2\angle ABC$

Q. In the given figure, $\angle ABD = 54^o$ and $\angle BCD = 43^o$, calculate

$\angle BAD$

Solution

We know that the angles in the same segment of a circle are equal

From the figure we know that $\angle BAD$ and $\angle BCD$ are in the segment BD

$\angle BAD = \angle BCD = 43^o$

Q. In figure, A, B and C are three points on the circle with centre O such that $\angle AOB = 90^o$

and $\angle AOC = 110^o$. Find $\angle BAC$.

Solution

From the figure we know that

$$\angle AOB + \angle AOC + \angle BOC = 360^o$$

By substituting the values

$$90^o + 110^o + \angle BOC = 360^o$$

On further calculation

$$\angle BOC = 360^o - 90^o - 110^o$$

By subtraction

$$\angle BOC = 360^o - 200^o$$

$$\angle BOC = 160^o$$

So we get

We know that

$$\angle BOC = 2 \times \angle BAC$$

It is given that $\angle BOC = 160^o$

$$\angle BAC = \frac{160^o}{2}$$

By division

$$\angle BAC = 80^o$$

Therefore, $\angle BAC = 80^o$

Q. In the given figure, AB and CD are two chords of a circle, intersecting each other at a point E. Prove that $\angle AEC = 1/2$ (angle subtended by arc CXA. At the centre + angle subtended by arc DYB at the centre).

Solution

Construct the line AC and BC

The angle subtended by an arc of a circle at its centre is twice the angle subtended by the same arc at a point on the circumference.

So we get

$\angle AOC = 2\angle ABC \ldots\ldots(1)$

In the same way

$\angle BOD = 2\angle BCD \ldots\ldots(2)$

By adding both the equations

$\angle AOC + \angle BOD = 2\angle ABC + 2\angle BCD$

aking 2 as common

$$\angle AOC + \angle BOD = 2(\angle ABC + \angle BCD)$$

It can be written as

$$\angle AOC + \angle BOD = 2(\angle EBC + \angle BCE)$$

So we get

$$\angle AOC + \angle BOD = 2(180^o - \angle CEB)$$

We can written it as

$$\angle AOC + \angle BOD = 2(180^o -- (180^o -- \angle AEC))$$

We get

$$\angle AOC + \angle BOD = 2\angle AEC$$

Dividing the equation by 2

$\angle AEC = 1/2(\angle AOC + \angle BOD)$

$\angle AEC = 1/2$ (angle subtended by arc CXA at the centre + angle subtended

by arc DYB at the centre)

Therefore, it is proved that $\angle AEC = 1/2$ (angle subtended by arc CXA. At the

centre + angle subtended by arc DYB at the centre,

Q. In the given figure, $\angle ABD = 54^o$ and $\angle BCD = 43^o$, calculate

$\angle ACD$

Q. In the given figure, O is the centre of the circle. If $\angle ABD = 35^o$ and $\angle BAC = 70^o$, find

$\angle ACB$.

Solution

We know that BD is the diameter of the circle

Angle in a semicircle is a right angle

$$\angle BAD = 90^o$$

Consider $\triangle BAD$

Using the angle sum property

$$\angle ADB + \angle BAD + \angle ABD = 180^o$$

By substituting the values

$$\angle ADB + 90^o + 35^o = 180^o$$

On further calculation

$\angle ADB = 180^o - 90^o - 35^o$

By subtraction

$\angle ADB = 180^o - 125^o$

So we get

$\angle ADB = 55^o$

We know that the angle in the same segment of a circle are equal

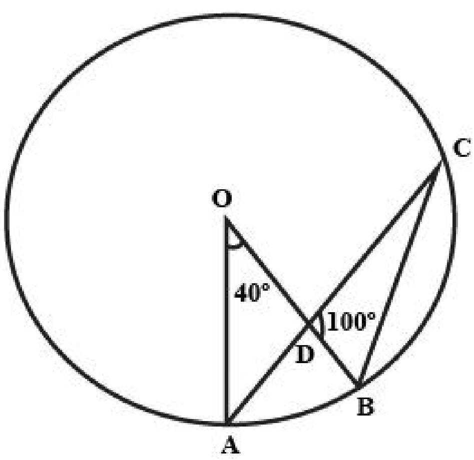
$\angle ACB = \angle ADB = 55^o$

So we get

$\angle ACB = 55^o$

Therefore, $\angle ACB = 55^o$

Q. In the given figure, O is the centre of a circle, ∠AOB = 40° and ∠BDC = 100°, find ∠OBC.



Solution

We know that the angle subtended by an arc of a circle at the centre is double the angle subtended by the arc at any point on the circumference

So we get

$\angle AOB = 2\angle ACB$

From the figure we know that

$\angle ACB = \angle DCB$

It can be written as

$\angle AOB = 2\angle DCB$

We know that

$\angle DCB = \frac{1}{2}\angle AOB$

By substituting the values

$\angle DCB = \frac{40^\circ}{2}$

By substituting the values we get

$100° + 20° + \angle DBC = 180°$

On further calculation

$\angle DBC = 180° - 100° - 20°$

By subtraction

$\angle DBC = 180° - 120°$

So we get

$\angle DBC = 60°$

From the figure we know that

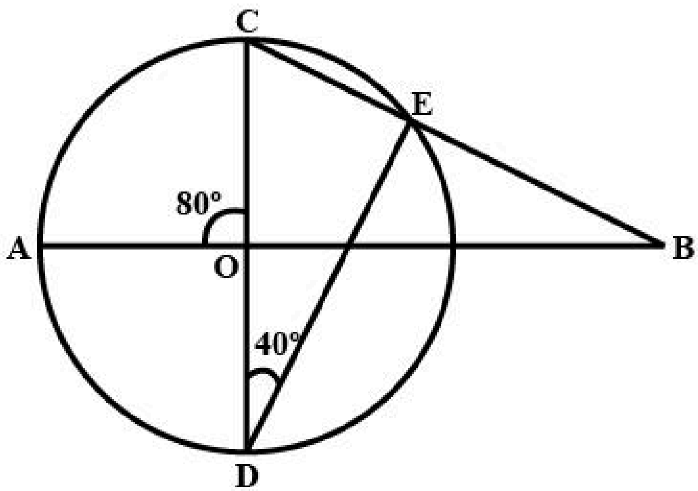
$\angle OBC = \angle DBC = 60°$

So we get

$\angle OBC = 60°$

Therefore , $\angle OBC = 60°$.

Q. In the given figure, AB and CD are straight lines through the centre O of a circle. If $\angle AOC = 80^\circ$ and $\angle CDE = 40^\circ$, find $\angle DCE$



Solution

From the figure we know that $\angle CED = 90°$

Consider $\triangle CED$

Using the angle sun property

$\angle CED + \angle EDC + \angle DCE = 180°$

By substituting the values

$90° + 40° + \angle DEC = 180°$

On further calculation

$\angle DCE = 180° - 90° - 40°$

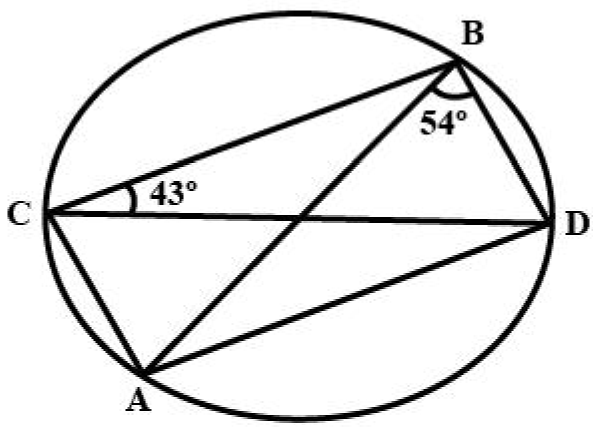
By subtraction

$\angle DCE = 180° - 130°$

so we get

$\angle DCE = 50°$

Q. In the given figure, $\angle ABD = 54°$ and $\angle BCD = 43°$, calculate $\angle BDA$



Solution

We know that angles in the same segment are equal

$\Rightarrow \angle BAD = \angle BCD$

$\Rightarrow \angle BAD = 43^\circ$

In $\triangle ABD$

Using the angle sum property

$\angle BAD + \angle ADB + \angle DBA = 180^\circ$

By substituting the values

$43^\circ + \angle ADB + 54^\circ = 180^\circ$

On further calculation

$\angle ADB = 180^\circ - 43^\circ - 54^\circ$

By subtraction

$\angle ADB = 180^\circ - 97^\circ$

$\angle ADB = 180^\circ - 97^\circ$

So we get

$\angle ADB = 83^\circ$

It can be written as

$\angle BDA = 83^\circ$

Benefits of RS Aggarwal Solutions for Class 10 Maths Chapter 12 Exercise 12.2

RS Aggarwal Solutions for Class 10 Maths Chapter 12 Exercise 12.2 on circles offer several benefits for students:

Systematic Approach: The solutions follow a structured and step-by-step approach to solving problems, which helps students understand the logical sequence of solving mathematical problems related to circles.

Clarity in Concepts: The solutions provide clear explanations and illustrations, making complex concepts easier to comprehend. This clarity helps students grasp the underlying principles and formulas related to circles.

Practice with Varied Problems: Exercise 12.2 typically includes a variety of problems covering different aspects of circles such as tangents, secants, angles subtended by chords, and more. By practicing these problems with detailed solutions, students gain proficiency in applying concepts to different scenarios.

Exam Preparation: RS Aggarwal Solutions are designed to align with the pattern and difficulty level of exams. Practicing these solutions helps students prepare effectively for their Class 10 Maths exams, ensuring they are well-equipped to tackle questions related to circles.

Self-Assessment: Each problem's solution includes a methodical approach, allowing students to self-assess their understanding and rectify mistakes. This self-assessment is crucial for improving problem-solving skills and building confidence.

Time Management: By practicing with RS Aggarwal Solutions, students can improve their speed and accuracy in solving circle-related problems. This is particularly important during exams where time management plays a crucial role.