

CBSE CLASS X

Mathematics Standard (041)

QUESTION PAPER

From previous CBSE Board Exam questions

Code: 6PUH16

Questions: 46

Maximum Marks: 108

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SELECTIONS USED

Source	Previous-year board
Subject	Mathematics
Lessons	Areas Related to Circles
Year	2022-2026
Questions selected	46

Composition — Types: 19 MCQ · 9 Short · 8 Case-based · 4 Very short · 4 Long · 1 Assertion–reason

Q1. § 11.2 Summary

[1]

The hour-hand of a clock is 6 cm long. The angle swept by it between 7:20 a.m. and 7:55 a.m. is:

- (a) $\frac{35}{4}^\circ$
- (b) $\frac{35}{2}^\circ$
- (c) 35°
- (d) 70°

Previously asked in: 2023 30/2/1 Q13

♦ Areas Related to Circles

Angle swept by clock hands and arc/area calculations

Q2. § 11.2 Summary

[1]

The hour hand of a clock is 7 cm long. The angle swept by it between 7:00 a.m. and 8:10 a.m. is :

- (a) $\left(\frac{35}{4}\right)^\circ$
- (b) $\left(\frac{35}{2}\right)^\circ$
- (c) 35°
- (d) 70°

Previously asked in: 2026 30/1/1 Q15

♦ Areas Related to Circles

Angle swept by clock hands and arc length

Q3. § 11.2 Summary

[1]

An arc of length 2.2 cm subtends an angle θ at the centre of the circle with radius 2.8 cm. The value of θ is

- (A) 50°
- (B) 60°
- (C) 45°
- (D) 30°

Previously asked in: 2026 30/5/1 Q13

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q4. § 11.2 Summary

[1]

Area of a segment of a circle of radius 'r' and central angle 60° is :

- A $\frac{\pi r^2}{2} - \frac{1}{2}r^2$
B $\frac{2\pi r}{4} - \frac{\sqrt{3}}{4}r^2$
C $\frac{\pi r^2}{6} - \frac{\sqrt{3}}{4}r^2$
D $\frac{2\pi r}{4} - r^2 \sin 60^\circ$

Previously asked in: 2026 30/2/1 Q15

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q5. § 11.2 Summary

[1]

The perimeter of the sector of a circle of radius 21 cm which subtends an angle of 60° at the centre of circle, is :

- A 22 cm
B 43 cm
C 64 cm
D 462 cm

Previously asked in: 2024 30/5/1 Q8

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q6. § 11.2 Summary

[1]

The length of an arc of a circle with radius 12 cm is 10π cm. The angle subtended by the arc at the centre of the circle, is :

- A 120°
B 6°
C 75°
D 150°

Previously asked in: 2024 30/5/1 Q9

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q7. § 11.2 Summary

[1]

If a sector of a circle has an area of 40 sq. units and a central angle of 72° , the radius of the circle is:

- A 200 units
B 100 units
C 20 units
D $10\sqrt{2}$ units

Previously asked in: 2025 30/1/1 Q15

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q8. § 11.2 Summary

[1]

A piece of wire 20 cm long is bent into the form of an arc of a circle of radius $\frac{60}{\pi}$ cm. The angle subtended by the arc at the centre of the circle is:

- A 30°
B 60°
C 90°
D 50°

Previously asked in: 2025 30/1/1 Q18

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q9. § 11.2 Summary**[3]**

A circle of diameter 20 cm is equally divided into five sectors. Find the area and perimeter of one of the sectors.

Previously asked in: 2026 30/5/1 Q26

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q10. § 11.2 Summary**[3]**

Find the area of the sector of a circle of radius 42 cm and of central angle 30° . Also, find the area of the corresponding major sector. [Use $\pi = \frac{22}{7}$]

Previously asked in: 2026 30/2/1 Q30

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q11. § 11.2 Summary**[3]**

In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find the area of the sector formed by the arc. Also, find the length of the arc.

Previously asked in: 2023 30/6/1 Q31

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q12. § 11.2 Summary**[3]**

An arc of a circle of radius 10 cm subtends a right angle at the centre of the circle. Find the area of the corresponding major sector. (Use $\pi = 3 \cdot 14$)

Previously asked in: 2024 30/5/1 Q31

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q13. § 11.2 Summary**[4]**

A brooch is a decorative piece often worn on clothing like jackets, blouses or dresses to add elegance. Made from precious metals and decorated with gemstones, brooches come in many shapes and designs.

One such brooch is made with silver wire in the form of a circle with diameter 35 mm. The wire is also used in making 5 diameters which divide the circle into 10 equal sectors as shown in the figure.

Based on the above given information, answer the following questions:

- (i) Find the central angle of each sector. [1]
- (ii) Find the length of the arc ACB . [1]
- (iii) Find the area of each sector of the brooch. [2]

Previously asked in: 2025 30/1/1 Q37

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q14. § 11.2 Summary**[1]**

What is the length of the arc of the sector of a circle with radius 14 cm and of central angle 90° ?

- (a) 22 cm
- (b) 44 cm
- (c) 88 cm
- (d) 11 cm

Previously asked in: 2023 30/2/1 Q2

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q15. § 11.2 Summary

[1]

If a large circular pizza is divided into 5 equal sectors, then the central angle of each sector will be :

- A 60°
- B 90°
- C 45°
- D 72°

Previously asked in: 2025 30/2/1 Q12

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q16. § 11.1 Areas of Sector and Segment of a Circle

[2]

In the given figure, the shape of the top of a table is that of a sector of a circle with centre O and $\angle AOB = 90^\circ$. If $AO = OB = 42$ cm, then find the perimeter of the top of the table.

Previously asked in: 2025 30/2/1 Q22 (OR-1)

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q17. § 11.2 Summary

[2]

In the given figure, three sectors of a circle of radius 5 cm, making angles 35° , 50° and 95° at the centre are shaded. Find the area of the shaded region. [Use $\pi = \frac{22}{7}$]

Previously asked in: 2025 30/2/1 Q22 (OR-2)

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q18. § 11.2 Summary

[5]

An arc of a circle of radius 21 cm subtends an angle of 60° at the centre. Find :

- (i) the length of the arc.
- (ii) the area of the minor segment of the circle made by the corresponding chord.

Previously asked in: 2024 30/1/1 Q32

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q19. § 11.2 Summary

[3]

A car has two wipers which do not overlap. Each wiper has a blade of length 21 cm sweeping through an angle of 120° . Find the total area cleaned at each sweep of the two blades.

Previously asked in: 2023 30/2/1 Q29

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q20. § 11.1 Areas of Sector and Segment of a Circle § 11.2 Summary

[3]

The length of the hour hand of a clock is 10 cm. Find the area of the minor sector swept by the hour hand of the clock between 5 a.m. to 8 a.m. Also, find the area of the major sector.

Previously asked in: 2025 30/2/1 Q29

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q21. § 11.1 Areas of Sector and Segment of a Circle § 11.2 Summary**[4]**

In an annual day function of a school, the organizers wanted to give a cash prize along with a memento to their best students. Each memento is made as shown in the figure and its base ABCD is shown from the front side. The rate of silver plating is ₹20 per cm^2 .

Based on the above, answer the following questions:

- (i) What is the area of the quadrant ODCO? [1]
- (ii) Find the area of triangle AOB. [1]
- (iii) What is the total cost of silver plating the shaded part ABCD? [2]

Previously asked in: 2023 30/2/1 Q36

♦ Areas Related to Circles 11.1 Areas of Sector and Segment of a Circle

Q22. § 11.2 Summary**[1]**

What is the area of a semi-circle of diameter d ?

- (a) $\frac{1}{16}\pi d^2$
- (b) $\frac{1}{4}\pi d^2$
- (c) $\frac{1}{8}\pi d^2$
- (d) $\frac{1}{2}\pi d^2$

Previously asked in: 2023 30/4/1 Q5

♦ Areas Related to Circles 11.1 Areas of Sector and Segment of a Circle

Q23. § 11.2 Summary**[1]**

If the area of a sector of a circle of radius 36 cm is $54\pi \text{ cm}^2$, then the length of the corresponding arc of the sector is:

- A 8 cm
- B 6 cm
- C 4 cm
- D 3 cm

Previously asked in: 2025 30/3/1 Q13

♦ Areas Related to Circles 11.1 Areas of Sector and Segment of a Circle

Q24. § 11.2 Summary**[3]**

A chord of a circle of radius 10 cm subtends a right angle at the centre of the circle. Find the area of the corresponding minor segment. [Use $\pi = 3.14$]

Previously asked in: 2025 30/3/1 Q29

♦ Areas Related to Circles 11.1 Areas of Sector and Segment of a Circle

Q25. § 11.1 Areas of Sector and Segment of a Circle § 11.2 Summary

[4]

The Olympic symbol comprising five interlocking rings represents the union of the five continents of the world and the meeting of athletes from all over the world at the Olympic games. In order to spread awareness about Olympic games, students of Class-X took part in various activities organised by the school. One such group of students made 5 circular rings in the school lawn with the help of ropes. Each circular ring required 44 m of rope. Also, in the shaded regions as shown in the figure, students made rangoli showcasing various sports and games. It is given that $\triangle OAB$ is an equilateral triangle and all unshaded regions are congruent.

Based on above information, answer the following questions :

- (i) Find the radius of each circular ring. [1]
- (ii) What is the measure of $\angle AOB$? [1]
- (iii) Find the area of shaded region R_1 . [2]

Previously asked in: 2025 30/4/1 Q36

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q26. § 11.2 Summary

[4]

Governing council of a local public development authority of Dehradun decided to build an adventurous playground on the top of a hill, which will have adequate space for parking.

After survey, it was decided to build rectangular playground, with a semi-circular area allotted for parking at one end of the playground. The length and breadth of the rectangular playground are 14 units and 7 units, respectively. There are two quadrants of radius 2 units on one side for special seats.

Based on the above information, answer the following questions :

- (i) What is the total perimeter of the parking area ? [1]
- (ii) What is the total area of parking and the two quadrants ? OR What is the ratio of area of playground to the area of parking area ? [2]
- (iii) Find the cost of fencing the playground and parking area at the rate of ₹ 2 per unit. [1]

Previously asked in: 2023 30/4/1 Q38

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q27. § 11.2 Summary

[4]

A farmer has a circular piece of land. He wishes to construct his house in the form of largest possible square within the land as shown below. The radius of circular piece of land is 35 m.

Based on given information, answer the following questions :

- (i) Find the length of wire needed to fence the entire land. [1]
- (ii) Find the length of each side of the square land on which house will be constructed. [1]
- (iii) The farmer wishes to grow grass on the shaded region around the house. Find the cost of growing the grass at the rate of ₹ 50 per square metre. [2]

Previously asked in: 2025 30/5/1 Q36

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Largest square inscribed in a circle

Q28. § 11.2 Summary

[5]

A horse is tied to a peg at one corner of a square shaped grass field of side 15 m by means of a 5 m long rope. Find the area of that part of the field in which the horse can graze. Also, find the increase in grazing area if length of rope is increased to 10 m. (Use $\pi = 3 \cdot 14$)

Previously asked in: 2023 30/5/1 Q35

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q29. § 11.2 Summary

[5]

The perimeter of a certain sector of a circle of radius 5.6 m is 20.0 m. Find the area of the sector.

Previously asked in: 2024 30/2/1 Q35

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q30. § 11.2 Summary

[1]

Perimeter of a sector of a circle whose central angle is 90° and radius 7 cm is :

- A 35 cm
- B 11 cm
- C 22 cm
- D 25 cm

Previously asked in: 2024 30/3/1 Q17

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q31. § 11.2 Summary

[1]

A circle is divided into 16 identical sectors. If radius of the circle is 7 cm, area of each sector is

- A $\frac{77}{4} \text{ cm}^2$
- B 77 cm^2
- C 154 cm^2
- D $\frac{77}{8} \text{ cm}^2$

Previously asked in: 2026 30/4/1 Q9

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q32. § 11.2 Summary

[4]

A stable owner has four horses. He usually tie these horses with 7 m long rope to pegs at each corner of a square shaped grass field of 20 m length, to graze in his farm. But tying with rope sometimes results in injuries to his horses, so he decided to build fence around the area so that each horse can graze.

Based on the above, answer the following questions :

- (i) Find the area of the square shaped grass field. [1]
- (ii) Find the area of the total field in which these horses can graze. [2]
- (iii) What is area of the field that is left ungrazed, if the length of the rope of each horse is 7 cm ? [1]

Previously asked in: 2024 30/3/1 Q36

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q33. § 11.2 Summary

[1]

Arc PQ subtends an angle θ at the centre of the circle with radius 6.3 cm. If $PQ = 11$ cm, then the value of θ is

- A 10°
- B 60°
- C 45°
- D 100°

Previously asked in: 2026 30/4/1 Q17

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q34. § 11.2 Summary

[1]

The length of the arc of the sector of a circle with radius 21 cm and of central angle 60° , is :

- (a) 22 cm
- (b) 44 cm
- (c) 88 cm
- (d) 11 cm

Previously asked in: 2026 30/1/1 Q14

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q35. § 11.2 Summary

[1]

If an arc subtends an angle of 90° at the centre of a circle, then the ratio of its length to the circumference of the circle is :

- A 2 : 3
- B 1 : 4
- C 4 : 1
- D 1 : 3

Previously asked in: 2024 30/4/1 Q5

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q36. § 11.2 Summary

[1]

The area of the sector of a circle of radius 12 cm is 60π cm². The central angle of this sector is :

- A 120°
- B 6°
- C 75°
- D 150°

Previously asked in: 2024 30/4/1 Q6

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q37. § 11.1 Areas of Sector and Segment of a Circle § 11.2 Summary

[3]

Chord AB of a circle with centre O and radius 21 mm subtends an angle of 120° at the centre. Find the perimeters of the shaded region. (Use $\sqrt{3} = 1.73$)

Previously asked in: 2026 30/4/1 Q27

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q38. § 11.2 Summary

[1]

Assertion (A) : If the circumference of a circle is 176 cm, then its radius is 28 cm.

Reason (R) : Circumference = $2\pi \times$ radius of a circle.

Select the correct answer from the codes (A), (B), (C) and (D) as given below.

A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

C Assertion (A) is true, but Reason (R) is false.

D Assertion (A) is false, but Reason (R) is true.

Previously asked in: 2024 30/4/1 Q20

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q39. § 11.2 Summary

[2]

The minute hand of a clock is 14 cm long. Find the area on the face of the clock described by the minute hand in 5 minutes.

Previously asked in: 2024 30/4/1 Q22(a) (OR-1)

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q40. § 11.2 Summary

[2]

Find the length of the arc of a circle which subtends an angle of 60° at the centre of the circle of radius 42 cm.

Previously asked in: 2024 30/4/1 Q22(b) (OR-2)

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q41. § 11.2 Summary

[4]

A brooch is crafted from silver wire in the shape of a circle with a diameter of 35 cm. The wire is also used to create 5 diameters, dividing the circle into 10 equal sectors as shown in figure.

Based on the above information, answer the following questions :

(i) What is the radius of circle ? [1]

(ii) What is the circumference of the brooch ? [1]

(iii) What is the total length of silver wire required ? [2]

Previously asked in: 2026 30/1/1 Q38

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q42. § 11.1 Areas of Sector and Segment of a Circle § 11.2 Summary

[1]

The circumferences of two circles are in the ratio 4 : 5. What is the ratio of their radii?

A 16 : 25

B 25 : 16

C $2 : \sqrt{5}$

D 4 : 5

Previously asked in: 2023 30/6/1 Q5

♦ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

Q43. § 11.1 Areas of Sector and Segment of a Circle**[3]**

In the given figure, chord AB subtends an angle of 120° at the centre of the circle with radius 7 cm. Find (i) perimeter of major sector OACB, and (ii) area of the shaded segment, if area of $\triangle OAB = 21 \cdot 2 \text{ cm}^2$.

Previously asked in: 2026 30/3/1 Q27

◆ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

8.3 Trigonometric Ratios of Some Specific Angles

Q44. § 11.2 Summary**[4]**

Anurag purchased a farmhouse which is in the form of a semicircle of diameter 70 m. He divides it into three parts by taking a point P on the semicircle in such a way that $\angle PAB = 30^\circ$ as shown in the following figure, where O is the centre of semicircle. In part I, he planted saplings of Mango tree, in part II, he grew tomatoes and in part III, he grew oranges.

Based on given information, answer the following questions.

- (i) What is the measure of $\angle POA$? [1]
- (ii) Find the length of wire needed to fence entire piece of land. [1]
- (iii) Find the area of region in which saplings of Mango tree are planted. [2]

Previously asked in: 2025 30/6/1 Q36

◆ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

8.3 Trigonometric Ratios of Some Specific Angles

Q45. § 11.2 Summary**[5]**

A chord of a circle of radius 14 cm subtends an angle of 60° at the centre. Find the area of the corresponding minor segment of the circle. Also find the area of the major segment of the circle.

Previously asked in: 2023 30/1/1 Q34

◆ Areas Related to Circles

11.1 Areas of Sector and Segment of a Circle

8.3 Trigonometric Ratios of Some Specific Angles

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