

DPP CLASS X CBSE - TERM 1

Mathematics -Areas Related to Circles

Multiple Choice Questions

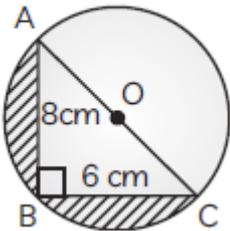
1. The area of a circle, whose circumference is 22 cm, is:

- (a) 54 cm² (b) 46 cm²
(c) 40.5 cm² (d) 38.5 cm²

2. If the sum of the circumferences of two circles with radii R₁ and R₂ is equal to the circumference of a circle of radius R, then:

- (a) R₁ + R₂ = R
(b) R₁ + R₂ > R
(c) R₁ + R₂ < R
(d) Nothing definite can be said about the relation among R₁, R₂ and R

3. In the figure, the area of the shaded portion is:



- (a) 15.25 cm² (b) 12.75 cm²
(c) 18.05 cm² (d) 20.60 cm²
[Use $\pi = 3.14$]

4. It is proposed to build a single circular park equal in area to the sum of areas of two circular parks of diameters 16 m and 12 m in a locality. The radius of the new park would be:

- (a) 10 m (b) 15 m
(c) 20 m (d) 24 m

5. The radii of two concentric circles are 4 cm and 5 cm. The difference in the areas of these two circles is:

- (a) π (b) 7π
(c) 9π (d) 13π

6. If the area of a circle is 154 cm², then its circumference is:

- (a) 11 cm (b) 22 cm
(c) 44 cm (d) 55 cm

7. A wire is in the shape of a circle of radius 21 cm. It is bent to form a square. The side of the square is:

- (a) 22 cm (b) 33 cm
(c) 44 cm (d) 66 cm

Use = $22/7$

8. The area of a circle that can be inscribed in a square of side 6 cm is:

- (a) 36π cm² (b) 18π cm²
(c) 12π cm² (d) 9π cm²

9. The outer and inner diameters of a circular ring are 34 cm and 32 cm respectively. The area of the ring is:

- (a) 66π cm² (b) 60π cm²
(c) 33π cm² (d) 29π cm²

10. The diameter of a circle whose area is equal to the sum of the areas of the two circles of radii 24 cm and 7 cm, is:

- (a) 31 cm (b) 25 cm
(c) 62 cm (d) 50 cm

11. If a circular grass lawn of 35 m in radius has a path 7 m wide running around it on the outside, then the area of the path is:

- (a) 1450 m² (b) 1576 m² (c) 1694 m² (d) 3368 m²

12.

If a square ABCD is inscribed in a circle of radius 'r' and AB = 4 cm, then the value of r is:

- (a) 2 cm (b) $2\sqrt{2}$ cm
(c) 4 cm (d) $4\sqrt{2}$ cm

13,

The radius of a circle whose circumference is equal to the sum of the circumferences of the two circles of diameters 36 cm and 20 cm is:

- (a) 56 cm (b) 42 cm (c) 28 cm (d) 16 cm

14,

If the difference between the circumference and radius of a circle is 37cm, then using $\pi = \frac{22}{7}$, the circumference (in cm) of the circle is :

- (a) 154 (b) 44
(c) 14 (d) 7

15.

The perimeter (in cm) of a square circumscribing a circle of radius 'a' cm, is:

- (a) 8a (b) 4a (c) 2a (d) 16a

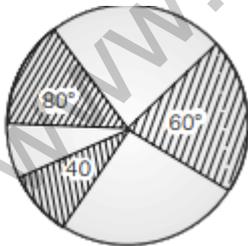
16.

In a right triangle ABC, right angled at B, BC = 12cm and AB = 5cm. The radius (in cm) of the circle inscribed in the triangle is:

- (a) 4 (b) 3
(c) 2 (d) 1 [CBSE 2014]

17.

In the given figure, three sectors of a circle of radius 7cm, making angles of 60° , 80° , 40° at the centre are shown. The area (in cm^2) of the shaded region is :



- (a) 77 (b) 154 (c) 44 (d) 22

18. The area of the circle is 154 cm^2 . The radius of the circle is

- (a) 7 cm

- (b) 14 cm
(c) 3.5 cm
(d) 17.5 cm

19 . If angle of sector is 60° , radius is 3.5 cm then length of the arc is

- (a) 3 cm
(b) 3.5 cm
(c) 3.66 cm
(d) 3.8 cm

20. The area of a quadrant of a circle whose circumference is 22 cm, is

- (a) $\frac{11}{8} \text{ cm}^2$ (b) $\frac{77}{2} \text{ cm}^2$ (c) $\frac{77}{4} \text{ cm}^2$ (d) $\frac{77}{8} \text{ cm}^2$

21. If θ is the angle in degrees of a sector of a circle of radius r , then area of the sector is

- (a) $\frac{\pi r^2 \theta}{180}$ (b) $\frac{\pi r^2 \theta}{360}$ (c) $\frac{2\pi r \theta}{180}$ (d) $\frac{2\pi r \theta}{360}$

22. A horse is tied to a peg at one corner of a square shaped grass field of side 15 m by means of a 7 m long rope. The area of that part of the field in which the horse can graze, is

- (a) 77 cm^2
(b) 772 cm^2
(c) 154 cm^2
(d) 774 cm^2

23. The area of the circle whose diameter is 21 cm is

- (a) 346.5 cm^2
(b) 37.68 cm^2
(c) 18.84 cm^2
(d) 19.84 cm^2

24. The area of the sector of a circle with radius 6 cm and of angle 60° is

- (a) 9.42 cm^2
(b) 37.68 cm^2
(c) 18.84 cm^2
(d) 19.84 cm^2

25 The area of a circle whose circumference is 22 cm, is

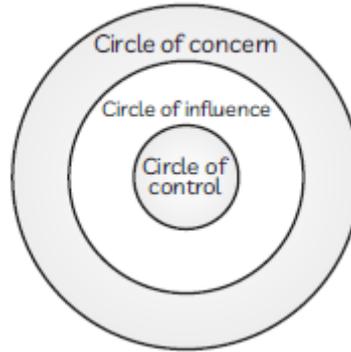
- (a) 11 cm^2
- (b) 38.5 cm^2
- (c) 22 cm^2
- (d) 77 cm^2

26. The area of a circle is 154 cm^2 . Its diameter is
- (a) 7 cm
 - (b) 14 cm
 - (c) 21 cm
 - (d) 28 cm

27. The length of the minute hand of a clock is 14 cm. The area swept by the minute hand in 5 minutes is
- (a) 153.9 cm^2
 - (b) 102.6 cm^2
 - (c) 51.3 cm^2
 - (d) 205.2 cm^2

CASE – STUDY QUESTIONS

28. *When we find ourselves in a crisis, our behaviour, thoughts and emotions are often in chaos. We feel out of control, helpless and hopeless. It's extremely unsettling and can lead to high levels of anxiety and depression. One of the tools that can help us to bounce back to be resilient is the Model of the 'Circles of Control, Influence and Concern'. This model is based on Stephen Covey's "Circle of Concern, Circle of Influence", which looks at where we focus our time and energy.*



Let the diameter of the innermost circle "circle of control" be 14 cm and both two circular regions, "circle of influence" and "circle of concern" are 7 cm wide.

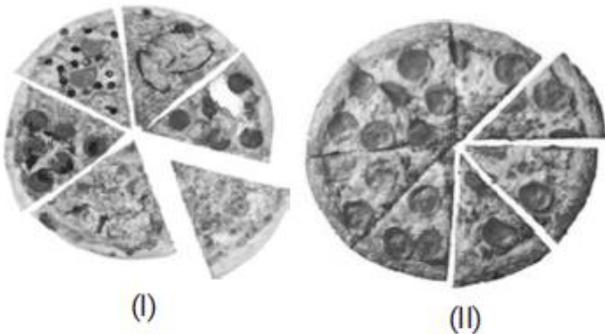
- (A) The radius of the outermost circle, "circle of concern" is:
- (a) 14 cm (b) 21 cm
 - (c) 10.5 cm (d) 7 cm
- (B) The area of the region "circle of influence" is equal to:
- (a) 928 cm^2 (b) 770 cm^2
 - (c) 616 cm^2 (d) 462 cm^2
- (C) The area of the outermost region "circle of concern" is:
- (a) $245 \pi \text{ cm}^2$ (b) $49 \pi \text{ cm}^2$
 - (c) $147 \pi \text{ cm}^2$ (d) $392 \pi \text{ cm}^2$
- (D) The ratio of circumference of the three circular regions, namely, "circle of control", "circle of influence" and "circle of concern" is:
- (a) 1 : 4 : 9 (b) 9 : 4 : 1
 - (c) 1 : 2 : 3 (d) 3 : 2 : 1
- (E) The ratio of areas of the three regions, namely, "circle of control", "circle of influence" and "circle of concern" is:
- (a) 1 : 9 : 25 (b) 1 : 3 : 5
 - (c) 1 : 4 : 9 (d) 5 : 3 : 1

29. *We all love to eat pizzas, especially kids. And a variety of pizzas are available in India which have been modified according to Indian taste and menu. From the Greeks to the Egyptians,*

from the Persians to the Indians, there have been incarnations of pizza served throughout history.

Flatbreads, naan, and plakountos are all early preparations that could be considered cousins to the modern pizza, but there isn't a consensus as to which is first and whether these could even be considered precursors to pizza at all.

Consider two pizzas, both of equal diameter, namely, 12 inches. The first pizza marked (I) has been cut into six equal slices, whereas the second pizza, marked (II) has been cut into eight equal slices.



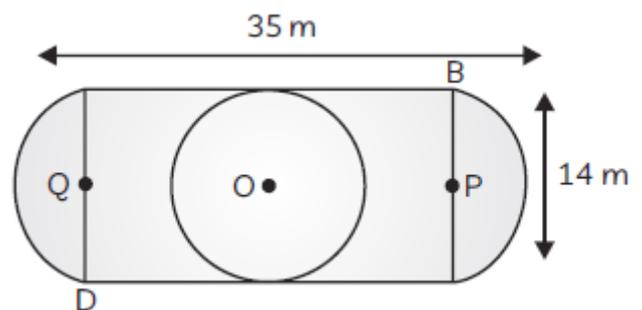
- (A) Find the area of one slice in pizza, marked (I).
- (B) Find the perimeter of the pizza slice shown in (I).
- (C) Find the ratio of area of a slice to the area of remaining pizza in (I).
- (D) Find the ratio of areas of each slice of pizza (I) and (II).
- (E) Find the relation between area of a sector A, length of the arc l, angle θ subtended by the arc at the centre and radius of circle.

30. Summer seasons are the best to enjoy cool shakes and ice creams! Saumya wanted to try watermelon sharbat which she had just learnt making from her online cooking classes during lockdown. She cut a slice of watermelon whose cross section was semi-circular in shape.



- If the perimeter of a semi-circular protractor is 36 cm, then its diameter is:
- (a) 12 cm (b) 13 cm
 - (c) 14 cm (d) 15 cm

31. A garden bed is shown below. It is a rectangle with semi-circular ends. It has a concrete circular fountain at the centre as shown. Grass is grown in the garden bed at all places except the central fountain region.



(A) The area of the concrete circular fountain at the centre is:

- (a) 77 m^2 (b) 308 m^2
(c) 154 m^2 (d) 616 m^2

(B) The area of one semi-circular end of the garden bed is:

- (a) 308 m^2
(b) 154 m^2
(c) 616 m^2
(d) 77 m^2

(C) Area of the garden bed where grass is grown is:

- (a) 616 m^2
(b) 294 m^2
(c) 381 m^2
(d) 458 m^2

(D) The outer perimeter of the lawn is:

- (a) 86 m (b) 114 m
(c) 130 m (d) 172 m

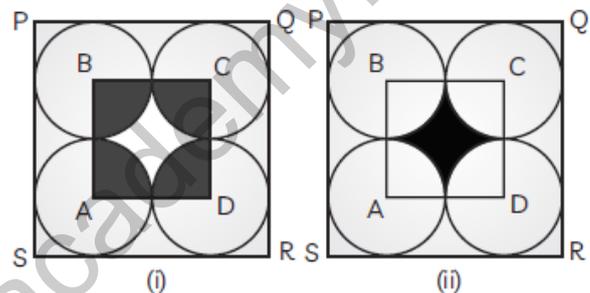
32. Swati and her friends went to a popular pizza joint at Kolkata city centre to enjoy their favourite pizza. When they noticed that a new pizza was just launched with four different but equal toppings they could not resist themselves and ordered one pizza. Each topping occupied a quadrant of a circle, as Swati remarked while relishing the pizza.



of radius ' r ' is:

- (a) $\frac{\pi r}{2}$ (b) $2\pi r$
(c) $\frac{r}{2} [\pi + 4]$ (d) $2\pi r + \frac{r}{2}$

33. A man wanted an attractive design on the front door of his house. So, he asked a painter to paint the design as per specifications provided by him. Four equal circles were inscribed inside a square PQRS of side 28 cm as shown in the figure below



(A) The diameter of each circle is:

- (a) 3.5 cm (b) 7 cm
(c) 12 cm (d) 14 cm

(B) Area of smaller square ABCD formed by joining the centres A, B, C and D of the four circles, is:

- (a) 49 cm^2 (b) 196 cm^2
(c) 824 cm^2 (d) 12.25 cm^2

(C) Refer to figure I, area of the shaded region is:

- (a) 154 cm^2 (b) 308 cm^2
(c) 616 cm^2 (d) 77 cm^2

(D) Area of the shaded portion in figure II, is:

- (a) 154 cm^2 (b) 77 cm^2
(c) 42 cm^2 (d) 21 cm^2

(E) Cost of painting the circular regions with centres A, B, C and D at Rs. 5.00 per sq. cm is:

- (a) Rs. 12320.00 (b) Rs.3080.00
(c) Rs. 6160.00 (d) Rs. 1540.00

34. Raghu has a habit of collecting coins not only from India but from all across the globe. He called his friends over to his place to show his prized possession and gave two of them, which were circular in shape, to his friend Pulkit



If the sum of the areas of two circles with radii R_1 and R_2 is equal to the area of a circle of radius R , then:

- (a) $R_1 + R_2 = R$ (b) $R_1^2 + R_2^2 = R^2$
 (c) $R_1 + R_2 < R$ (d) $R_1^2 + R_2^2 < R^2$

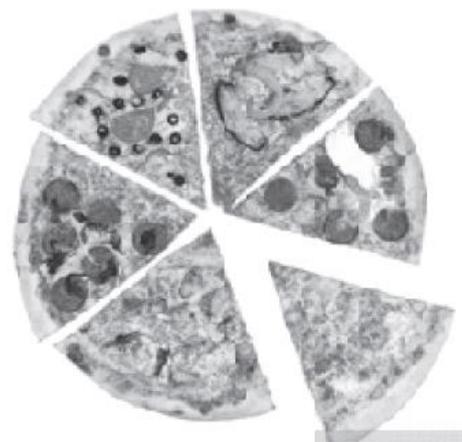
35. A girl purchased a pair of ear rings as shown below. The ring consisted of four circles marked C_1 , C_2 , C_3 and C_4 from innermost circle to outermost circle. The diameter of the innermost circle C_1 is 14 cm and radius of each of the next circle is double the radius of the preceding inner circle



- (A) The radius of the outermost circle C_4 is:
 (a) 112 cm (b) 56 cm

- (c) 28 cm (d) 14 cm
 (B) The area of the circle C_2 is:
 (a) 154 cm^2 (b) 308 cm^2
 (c) 616 cm^2 (d) 1232 cm^2
 (C) The length of a colourful thread used to decorate the boundary of the outermost circle C_4 is:
 (a) 352 cm (b) 704 cm
 (c) 176 cm (d) 88 cm
 (D) The area of the region between the innermost circle C_1 and the circle C_2 having dots, is:
 (a) $588 \pi \text{ cm}^2$ (b) $294 \pi \text{ cm}^2$
 (c) $147 \pi \text{ cm}^2$ (d) $73.5 \pi \text{ cm}^2$
 (E) The ratio of areas of innermost circle C_1 and outermost circle C_4 is:
 (a) 1 : 4 (b) 1 : 8
 (c) 1 : 16 (d) 1 : 64

36. Jayesh and his friends were celebrating birthday of a friend and ordered pizzas for themselves. Each of them took a slice of the pizza.

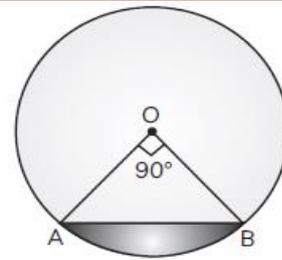


In a circle of diameter 42 cm, if an arc subtends an angle of 60° at the centre where $p = \frac{22}{7}$, then what will be the length of arc?

37. The South Central Zone of Indian Railways has commissioned the longest electrified railway tunnel in the country. According to local media reports, the construction of the 6.6km-long tunnel took 43 months to

complete. The electrified railway tunnel is situated between Cherlopalli and Rapuru stations as a part of the Obulavaripalli-Venkatachalam railway line. The tunnel is expected to facilitate freight movement in the region, reducing the distance between Krishnapatnam Port and hinterland areas by nearly 60km.

The adjoining figure shows a cross-section of the railway tunnel, which is a part of a circle. The radius OA of the circular part is 4 m and $\angle AOB = 90^\circ$.



- (a) $(3\pi - 2) \text{ m}^2$ (b) $(\pi - 2) \text{ m}^2$
(c) $4(\pi + 2) \text{ m}^2$ (d) $4(\pi - 2) \text{ m}^2$

- (C) The area of major sector is:
(a) $12\pi \text{ m}^2$ (b) $9\pi \text{ m}^2$
(c) $6\pi \text{ m}^2$ (d) $3\pi \text{ m}^2$
- (D) The perimeter of cross-section is:
(a) $(2\pi + 4\sqrt{2}) \text{ m}$ (b) $(6\pi + 2\sqrt{2}) \text{ m}$
(c) $(6\pi + 4\sqrt{2}) \text{ m}$ (d) $(6\pi - 4\sqrt{2}) \text{ m}$

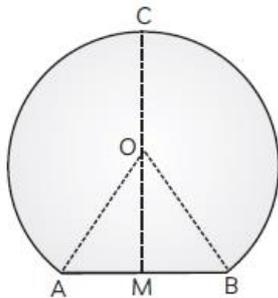
38. When Rohan came out of his school and went to the cycle stand, he was shocked to see that the wheel of his cycle was damaged beyond repair. So, he went to the cycle shop with his father in the evening to buy a new cycle wheel.



The diameter of a cycle wheel is 21 cm. How many revolutions will it make in moving 66 m? _____

39. Pookalam is the flower bed or flower pattern designed during Onam in Kerala. It is similar as Rangoli in North India and Kolam in Tamil Nadu.

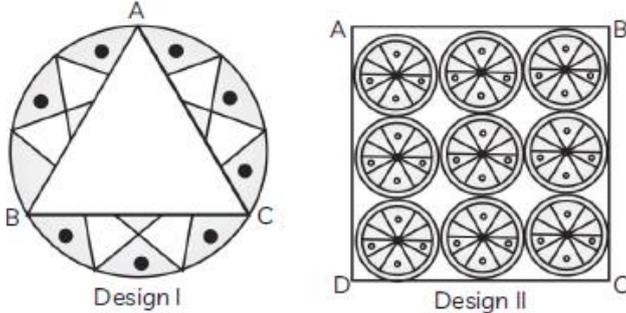
During the festival of Onam, your school is planning to conduct a Pookalam competition.



- (A) The height of the tunnel is:
(a) $(2 + \sqrt{2}) \text{ m}$ (b) $2(2 + \sqrt{2}) \text{ m}$
(c) $(2 - \sqrt{2}) \text{ m}$ (d) $2(2 - \sqrt{2}) \text{ m}$

(B) Considering the tunnel to be part of a circle as shown below, the area of minor segment is:

Your friend who is a partner in competition, suggests two designs given below. Observe these carefully.



Design I: This design is made with circle of radius 32 cm giving equilateral triangle ABC in the middle as shown the given figure.
Design II: This Pokalam is made with 9 circular design each of radius 7 cm

Refer Design I:

- (A) The side of equilateral triangle is:
(a) 123 cm (b) 323 cm
(c) 48 cm (d) 64 cm
(B) The altitude of the equilateral triangle is:

- (a) 8 cm (b) 12 cm
(c) 48 cm (d) 52cm

Refer Design II:

- (C) The area of square is:
(a) 1264 cm² (b) 1764 cm²
(c) 1830 cm² (d) 1944 cm²
(D) Area of each circular design is:
(a) 124 cm² (b) 132 cm²
(c) 144 cm² (d) 154 cm²
(E) Area of the remaining portion of the square ABCD is:
(a) 378 cm² (b) 260 cm²
(c) 340 cm² (d) 278 cm²

Assertion- Reasoning Questions

Each questions contain an assertion followed by reason. Read them carefully and answer the questions on the basis of following options, select the one that best describes the two statements.

(a) If both Assertion and Reason are correct

and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

(c) If Assertion is correct but Reason is incorrect.

(d) If Assertion is incorrect but Reason is correct.

40. Assertion : The circumference of two circle are in the ratio of 4 : 9, then ratio of their areas is 16 : 81.

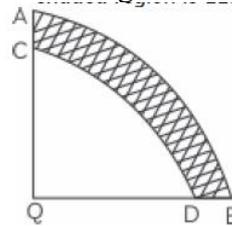
Reason : The circumference of a circle of diameter 'd' is πd and its area

$$\pi \left(\frac{d}{2}\right)^2$$

41. Assertion : If a wire of length is 22 cm, which is bent in the form of a circle then area of circle formed is 32 cm².

Reason : Length of wire, will be the circumference of a circle, which will help to calculate the radius of the circle.

42. Assertion : In the given figure if OA = 26 m and OC = 23m, then area of shaded region is 115.5cm²



Reason : Area of circle is given by πr^2

43. Assertion : Perimeter of a semicircle is πr , where r is the radius of the circle.

Reason : Perimeter is the boundary of any geometrical shape.

44. Assertion : If circumference of two circles are equal, then their areas are also equal.

Reason : Two circles are congruent if their ratio are equal

45. Assertion (A): The diameter of a circle whose area is equal to the sum of the areas of the two circles of radii 24 cm and 7 cm is 50 cm.

Reason (R): If the perimeter and the area of a circle are numerically equal, then the radius of the circle is 2 units.

46.

Assertion (A): If circumferences of two circles are equal, then their areas will be equal.

Reason (R): If the areas of two circles are equal, then their circumferences are equal

47.

Assertion (A): In covering a distance s meter, a circular wheel of radius r meter makes $\frac{s}{2\pi r}$ revolution.

Reason (R): The distance travelled by a circular wheel of diameter d cm in one revolution is $2\pi d$ cm.

Fill in the blanks

48. The ratio of the areas of a circle and an equilateral triangle whose diameter and a side are respectively equal, is

49. The radius of a wheel is 0.25 m. The number of revolutions it will make to travel a distance of 11 km, is

50. If the area of circle is 616 cm^2 , then its circumference is