MATHS

BOOKS - V PUBLICATION

CIRCLE MEASURES

Questionbank

1. Prove that the.circumcentre of an equilateral triangle is the same as its centroid.

i) Calculate the length of a side. of an

equilateral triangle with vertices on a circle of diameter 1 ceritimetre.

ii). Calculate the perimeter of such a triangle.

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2. Calculate the perimeter of a square with vertices on a circle of diameter 1 centimetre.

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3. Calculate the perimeter of a regular hexagon with vertices on a circle of diameter 1 centimetre.

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4. The perimeter of a regular hexagon with vertices on a circle is 24cm.

i) What is the perimeter of a square with vertices on this circle?

ii) What is the perimeter of a square with vertices on a circle of double the diameter?

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5. A wire was bent into a circle of diameter 4 centimetres. What would be the diameter of a circle made by bending a wire of half the length?

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6. The perimeter of a circle of diameter 2 metres was measured and found to be about.6.28 metres. How do we compute the perimeter of a circle of diameter 3 metres, without measuring?

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7. In the pictures below, a regular hexagon, square and rectangle are drawn with their vertices on a circle. Calculate the perimeter of

each circle.

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'(##VPU_HSS_MAT_IX_C09_E02_002_Q02##)'

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8. An isosceles triangle with its vertices on a circle is shown in this picture. What is the perimeter of the circle?

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9. In all the picture below, the centres of the circles are on the same line. In the first two pictures, the small circles are of the same diameter.

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10. Prove that in all pictures, the perimeters of the large circle is the sum of the perimeters of the'small circles.

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11. In this picture, the circles have the same centre and the line drawn is a diameter of the large circle. How múch more is, the perimeter of the large circle than the perimeter of the small circle?

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12. Corners of a square are. on a circle. If the length of one side of square is 10 cm, find the perimeter of the circle.

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13. A wheel is of radius 30 cm. If the wheel revolves 200 times in one minute then find the speed of wheel in km/hour.

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14. The diameter of a car wheel is 60 cm. How many revolutions does If make in travelling 5 km?

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15. A wheel is of radius 20 cm. If it make 10 revolution ,find the distance of the wheel goes ahead.

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16. In the pictures below, find the difference between the areas of the circle and the polygon, up to two decimal places

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17. The pictures below show circles through the vertices of a square and a rectangle.Calculate the areas of the circles

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18. Draw a square and draw circles centered on the corners, of radius half the side of the square Draw another square formed by four of the first square and a circle just fitting into it:

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19. Prove that the ared of the large circle is equal to the sum of the area of the four small circles.

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20. In the two pictures below, the squares are of the same size.

Prove that the green regions are of the same area.

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21. Parts of circles are drawn inside a square as shown in the picture below.

Prove that the area of the blue region is half the area of the square.

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22. In the figure, semicircles are drawn with the sides of a triangles as diameters. Prove that the area of the largest semicircle is the sum of the areas of the smaller ones.

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23. A wire 66 cm long is bent into a circle. What is the area enclosed within it?

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24. A circular dining table has 6.16 sq.m area. What length of wooden rod should be bought to make a border around its edge?

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25. Suppose that each side of the square in the picture has length 12 cm . What is the area of the shaded part?

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26. Suppose that the diameter of the circle in the picture below is 18 cm .` What is the area of the shaded part?

'(##VPU_HSS_MAT_IX_C09_E03_011_Q01##)'

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27. In each of the figures below, find the area of the shaded part. All lengths are. 'in

centimetres.

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28. In a circle of radius 3 centlmetres, what is the length of an arc of central angle 60° ? .

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29. What is the length of an arc of central angle 50°, in a circle of radius 2.5

centimetres?

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30. From an iron ring of radius 9 centimetres, a piece of central angle 30° is cut off. This is then bent into a small circle. What is the radius of this circle?

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31. From an iron ring of radius 9 centimetres, a piece of central angle 30° is cut off. This is then bent into a small circle. What is the radius of this circle?

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32. In a circle, the length of an arc of central angle 40° 'is 3π centimetres. What is the perimeter of the circle? What is its radius?

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33. In a circle, the length of an arc of central angle 25° is 4 centimetres.

i) In the same circle, what is the length of an arc of central angle 75° ?

Ii) In a circle of radius one and a half xx the radius of this circle, what is the length of an arc of central angle 75° ?

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34. From a bangle of radius 3 centimeters, a piece is to be cut out to make a ring of radius $\frac{1}{2}$ centimeters.

i) What should be the central angle of the piece to be cut out?

ii) The remaining part of the bangle was: bent to make a smaller bangle. What is its radius?

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35. The picture shows the parts of a circle centered at each vertex of an equilateral triangle and passing through the other two vertices. What is the perimeter of this figure?

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36. Part of circles are drawn, centred at each vertex of a regular octagon and a figure is cut out as show below:Calculate the perimeter of the figure.

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37. If the length of an arc of a sector having radius $9cm$ is $2\pi cm$, then find the central angle of the sector?


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38. A rod of length $20cm$ is bent in thè form of an arc. If the central angle of this arc.is 60°, then find the perimeter of the circle?


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39. The length' of an arc of a circle is $4cm$. What is the length of an arc of the same central angle in a circle of double the radius?

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40. Find the circumference of a circle of area $15sq.\ cm$

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41. If the perimeter of a circle and perimeter of a square are equal, then find the ratio of their arẽas.

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42. What is the area of a sector of central angle 120° in a circle of radius 3 centimetres? What is the areá of a sector of. the same central angle in a circle of radius 6 centimetres?

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43. Calculate the-area of the green colored part of this picture:

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44. Centered at each corner of a regular hexagon, a part of a circle is drawn and a figure is cut out as shown below:

What is the area of this figure?

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45. The picture below shows two circles, each passing through the center of the other. Calculate the area of the region common to both.

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46. The figure shows three circles drawn with their centers on each vertex of an equilateral triangle' and passing through the other two

vertices. Find the area of the region common to all three.

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47. The picture shóws a rectangular sheet of metal with two semicircles (half circles) are,cut away. Find its area.

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48. A garden is in the shape shown below, with two semicircles on the shorter sides of a rectangle of sides 30 m and 20 m. What is the cost of planting grass in it, if the rate is Rs 25 for each square meter.

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49. The pendulum in a clock is $14\text{-}cm$ long. It moves through 40° makes one oscillation.

What is the distance travelled by the tip of the pendulum during one oscillation?

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50. The minute hand of a clock is $20\text{~}cm$ long. What is the area it sweeps off from $5:10$ AM to $5:25$ AM?

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51. In the picture below, C is the centre of the circle. Find the area of the shaded portion.

'(##VPU_HSS_MAT_IX_C09_E06_010_Q01##)'

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52. In the picture ACB is an arc of the circle with centre O and radius OA. Find the area of the shaded region.

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53. In the picture below, AB and CD are ärcs of circles centred at 0. If $OA = 8cm$ and $OC = 12cm$, find the area of the shaded region.

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54. Find the relation between the length of an arc and the area of the sector formed by It.

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55. The figure shown below is formed by a rectangle with semicircles on each of its four sides. If the sides of the rectangle are 16 cm and 12 cm, what is the area of the figure?

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56. Each side of the regular hexagon in the figure below is 20 cm long. Find the area of the shaded portion of the figure.

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57. The shape of a garden is as shown below, a square with semicircles on each of its sides. If the perimeter of the garden is 352 meters, what is its area?

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58. The perimeter of a sector of a circle is $25.28cm$ and the length of its arc is $14.08cm$. What is its area?

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59. The sides of a triangular field aré $35m$, $42m$ and $47m$, There is a wall around the field, and within it, at each corner a cow is tied with a piece of rope $7m$ long. What is the total area of the region that the three cows can graze?

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60. In the picture below, O is the center of the circle and $OABC$ is a rectangle OA =8c.m OC =15cm. Find the area of the shaded portion of the circle.

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61. At a certain speed, the wheel of a bicycle rotates 100 xx per minute and at this speed, the bicycle travels 11 km in 11 minutes. What is the diameter of the wheel?

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62. In the picture below, ACB is a semicircle. Find the area of the shaded portion of the figure.

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63. Among an equilateral triangle, a square, a regular hexagon and a circle, all with the same perimeter, which has the largest area?

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64. From a rectangular sheet measuring $84cm$ by $24cm$, how many discs of radius 4 cm can be cut out?

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65. With each vertex of an equilateral .trianigle as centre a circle is drawn as shown in the picture. If the area of the triangle is $17300sq_{-}cm$, what is the area of the shaded

portion?

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66. ABC is an equillateral triangle and O is'the clrcumcentre of the triangle. Triangle divides the circle into. three arcs. Length of one arc is $10\pi cm$

'(##VPU_HSS_MAT_IX_C09_E07_001_Q01##)'.a) - What is the perimieter of the circle?

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

c) Find the area of the shaded region?

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67. O is the centre of the circle.

$AB = BC = AC = 10cm$`

a) < A O B= -

b) What is the radius of the circle?

c) Find the area of the circle.

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68. In the figure, all the vertices of the rectangle $ABCD$ are points of the circle,

a)Find the length of the diameter of the circle.

b) Find the circumference of the circle.

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69. The length of a side of the square in the given figure is 4 centimeters. Sectors are drawn with vertices of the square as centers.

a)What is the radius of the sectors?

b) Find the total area of all the four sectors.

c) Find the area of the shaded region.

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70. Corners of a square are. on a circle. If the length of one side of square is 10 cm, find the perimeter of the circle.

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71. What is the area of the large triangle inscribed in a semicircle of radius r?

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72. The minute hand of a clock is $12\text{-}cm$ long. What is the area it sweeps of from $6.10AM$ to 6.30 AM?

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73. Area of a circle'is 625π sq.cm and area of a sector in this circle is 125π sq.cm

. i) Find the central angle of the sector.

ii) Find the arc length of the sector.

iii) Find the perimeter of the sector.

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74. A car has two wipers which do not overlap. Eàch wiper has a blade of length $25\text{-}cm$

sweeping through an' angle of 115°. Find the total area cleaned at each sweep of the blades.

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