doubtnut
India's Number 1 Education App

MATHS

BOOKS - CHETANA MATHS (MARATHI ENGLISH)

Mensuration

Example

1. Find the total surface area of a cylinder if the radius of its base is 5 cm and height is 40

cm.

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2. In the adjoining figure a cyindrical wrapper of flat tablets is shown. The radius a tablet is 7 mm and its thickness is 5 mm. How many such tablets are wrapped in the wrapper?

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3. Some plastic balls of radius 1 cm were melted and cast into a tube. The thickness, length and outer radius of the tube were 2 cm, 90 cm, and 30 cm respectively. How many balls were melted to make the tube?

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4. A metal parallelopiped of measure 16 cm $\times$ 11 cm $\times$ 10 cm was melted to make coins. How many coins were made if the thickness

and diameter of each coin was 2 mm and 2 cm respectively?

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5. The diameter and length of a roller is 120 cm and 84 cm respectively. To level the ground, 200 rotations of the roller are required. Find the expenditure to level the ground at the rate of ~ 10 per sq. m.

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6. Find the volume of cone if the radius of its base is 1.5 cm and its perpendicular height is 5 cm.

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7. The dimensions of a cuboid are 44 cm, 21 cm, 12 cm. It is melted and a cone of heigth 24 cm is made. Find the radius of its base.

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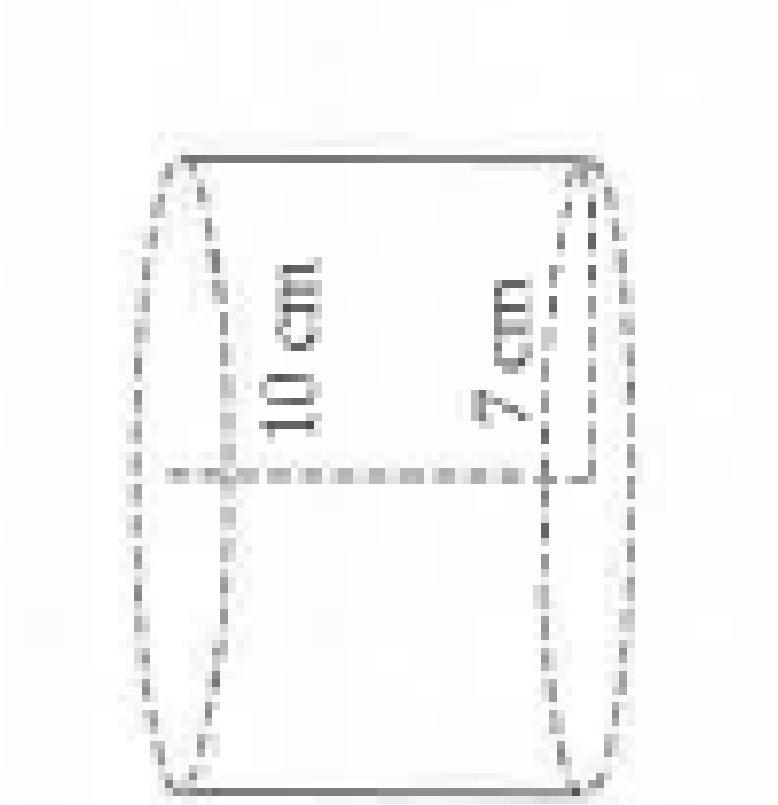
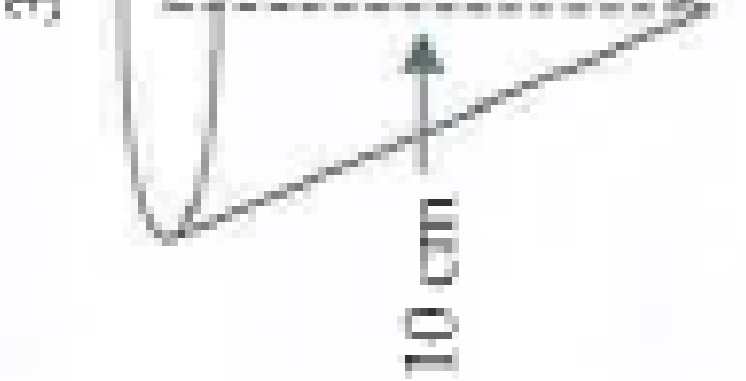
8. Observe the measures of pots in below figure. How many jugs of water can the cyindrical pot hold?





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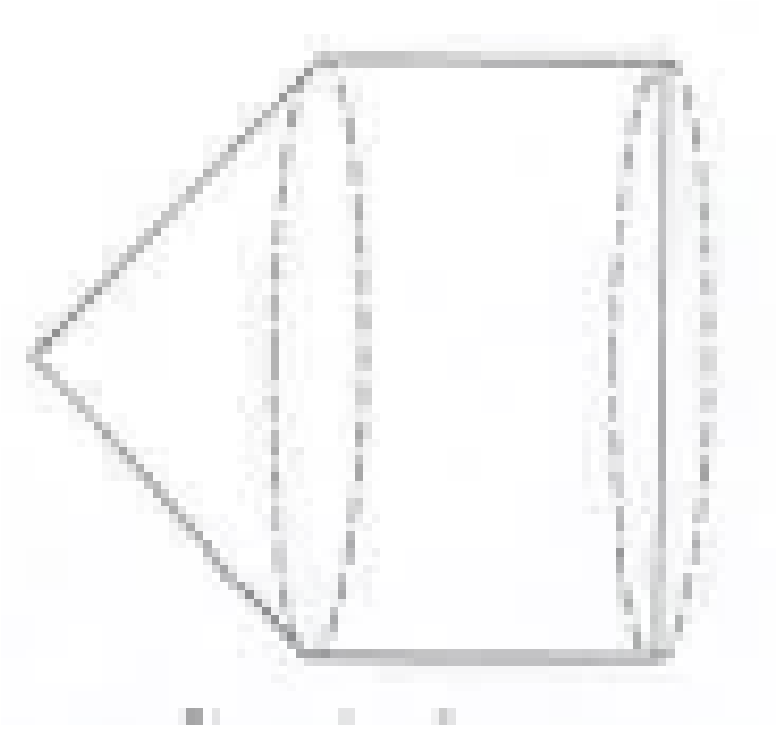
9. A cylinder and a cone have equal bases. The height of the cylinder is 3 cm and the area of its base is $100cm^2$. The cone is placed upon the cylinder. Volume of the solid figure so

formed is $500cm^3$. Find the total height of figure



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10. A cylinder bucket of diameter 28 cm and height 20 cm was full of sand. When the sand in the bucket was poured on the ground, the sand got converted into a shape of a cone. If the height of the cone was 14 cm, what was the base area of the cone?

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11. Find the volume of a shpere with diameter 6 cm.

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12. Find the surface area of sphere of radius 7 cm.

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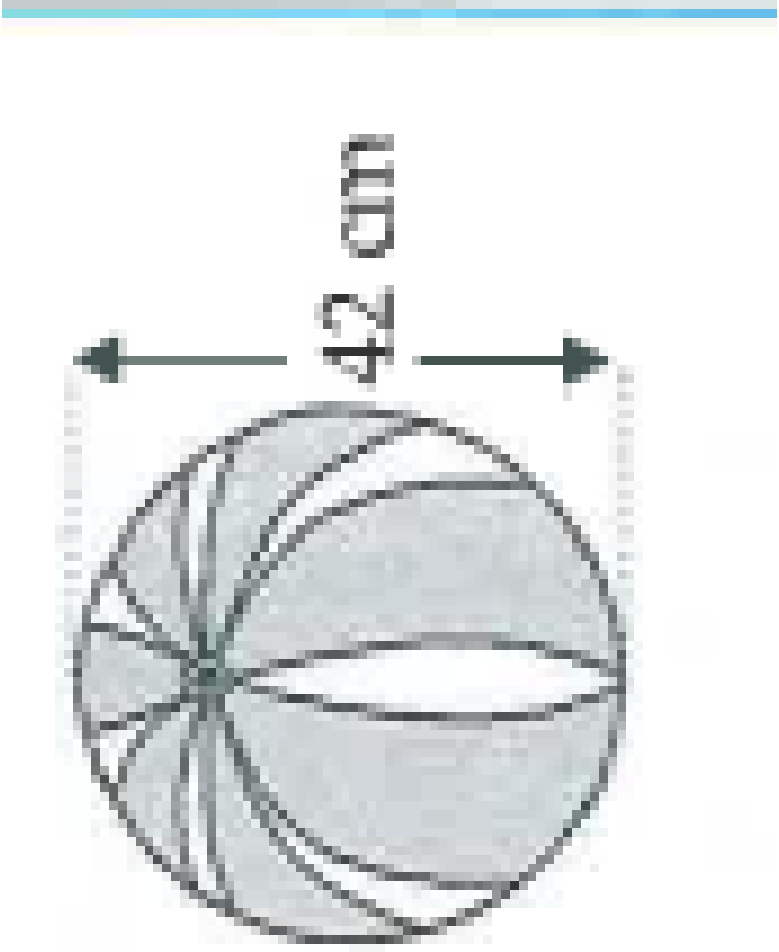
13. Find the surface area and the volume of a beach ball shown in the figure.



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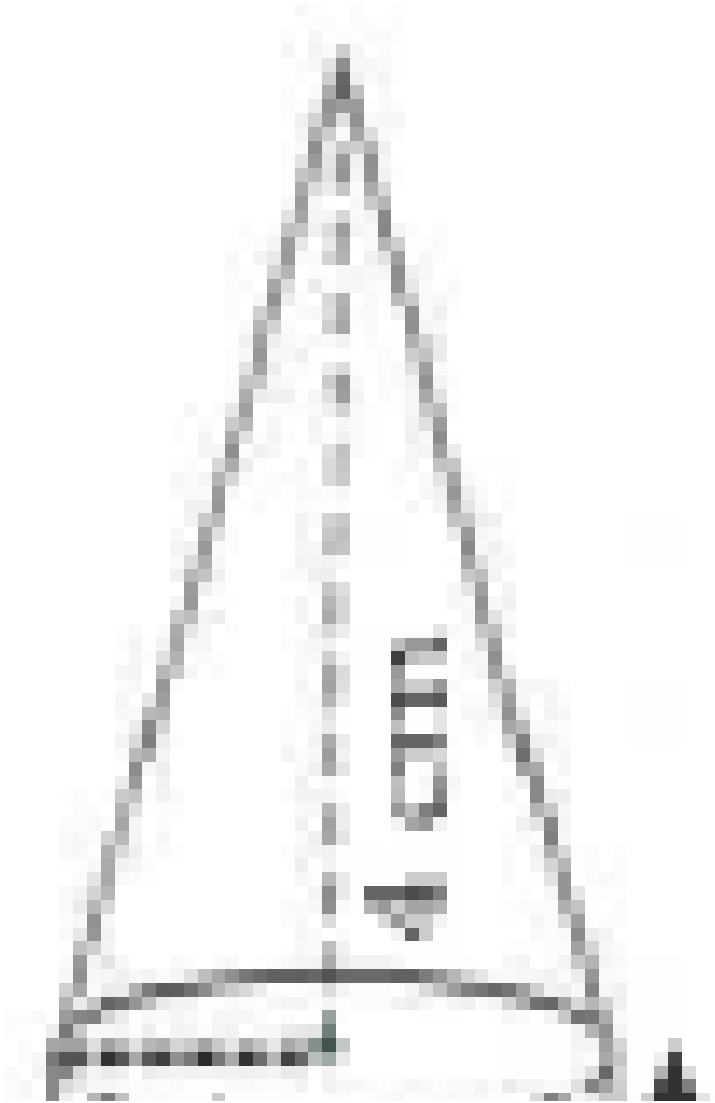
14. In below figure, a toy made from a hemishpere, a cylinder and a cone is shown. Find the total area of the toy.



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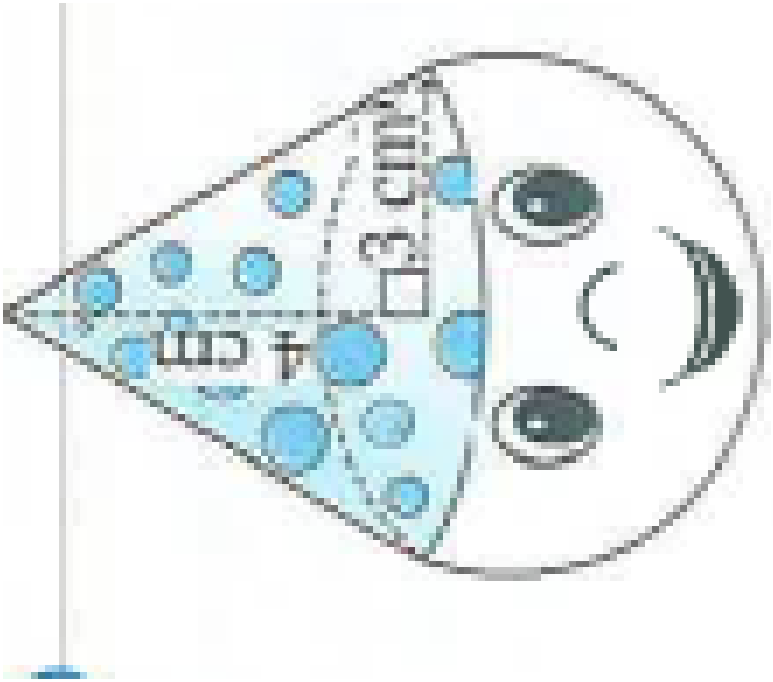
15. The adjoining figure shows a toy. Its lower part is a hemisphere and the upper part is a cone. Find the volume and the surface area of the toy from the measures shown in the

figure. $(\pi = 3.14)$



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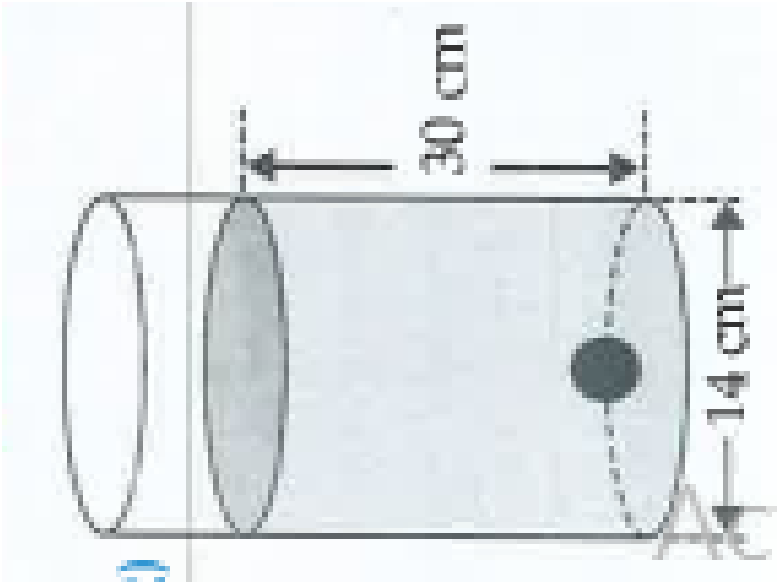
16. As shown in the figure, a cylindrical glass contains water. A metal shpere of diameter 2

cm is immersed in the water. Find the volume of water.



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17. The diameter and thickness of a hollow metallic sphere are 12 cm and 0.01 m

respectively. The density of the metal is 8.88 gm per cm^3. Find the outer surface area and mass of the sphere.

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18. The radius of a metallic sphere is 9 cm. It was melted to make a wire of diameter 4 mm. Find the length of the wire.

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19. The radii of two circular ends of frustum shaped bucket are 14 cm and 7 cm. Height of the bucket is 30 cm. How many litres of water it can hold? (1 litre = 1000 cm^3)

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20. The radii of ends of a frustum are 14 cm and 6 cm respectively and its height is 6 cm. Find its (i) curved surface area

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21. The radii of ends of a frustum are 14 cm and 6 cm respectively and its height is 6 cm. Find its (ii) Total surface area

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22. The radii of ends of a frustum are 14 cm and 6 cm respectively and its height is 6 cm. Find its (iii) Volume $(\pi = 3.14)$.

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23. The circumferences of circular faces of a frustum are 132 cm and 88 cm and its height is 24 cm. Find curved surface area of frustum. $\left(\pi = \frac{22}{7}\right)$

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24. A washing tub in the shape of a frustum of a cone has height 21 cm. The radii of the circular top and bottom are 20 cm and 15 cm

respectively. What is the capacity of the tub?

$\left(\pi = \frac{22}{7}\right)$

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25. Radius of a circle is 10 cm. Measure of an arc of the circle 54°. Find the area of the sector associated with the arc. $(\pi = 3.14)$

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26. Measure of an arc of a circle is 80 cm and its radius is 18 cm. Find the length of the arc $(\pi = 3.14)$

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27. Radius of a sector of a circle is 3.5 cm and length of its arc is 2.2 cm. Find the area of the sector.

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28. Radius of a circle is 10 cm. Area of a sector of the circle is 100 cm^2. Find the area of its corresponding major sector. $(\pi = 3.14)$

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29. Area of sector of a circle of radius 15 cm is 30 cm^2. Find the length of the arc of the sector.

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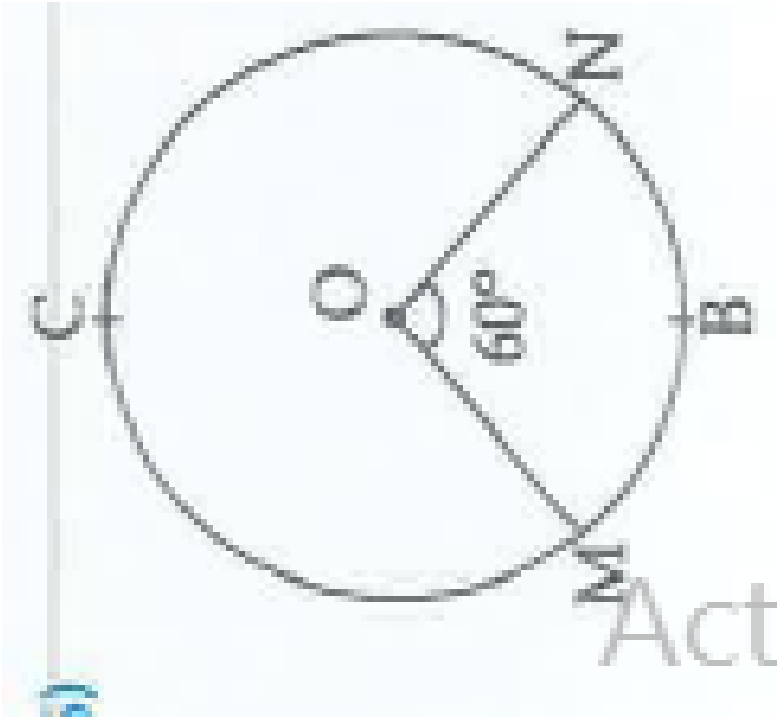
30. In the adjoining figure, the radius of the circle is 7 cm and m (arc MBN) = 60°. Find (i) Area of the circle



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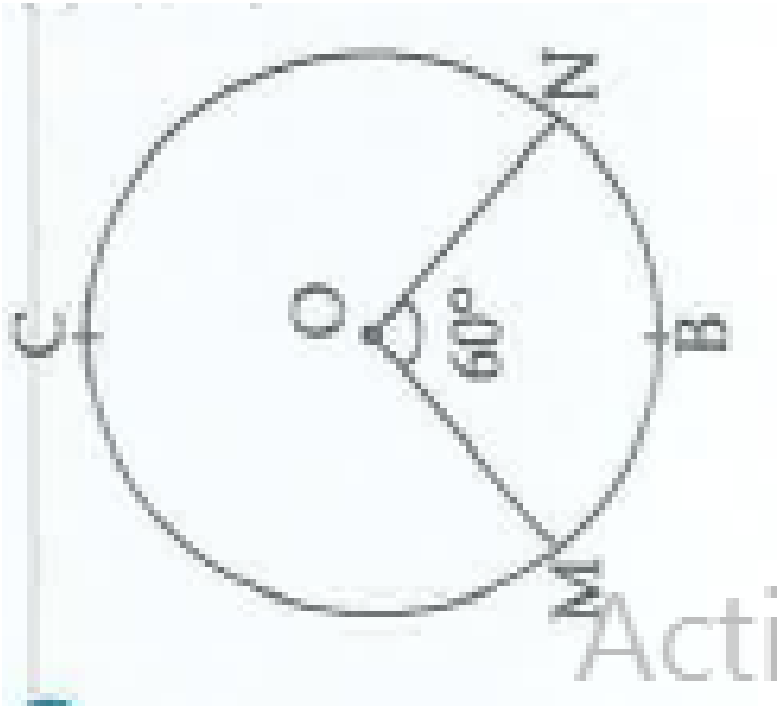
31. In the adjoining figure, the radius of the circle is 7 cm and m (arc MBN) = 60°. Find (ii) A (O-MBN)



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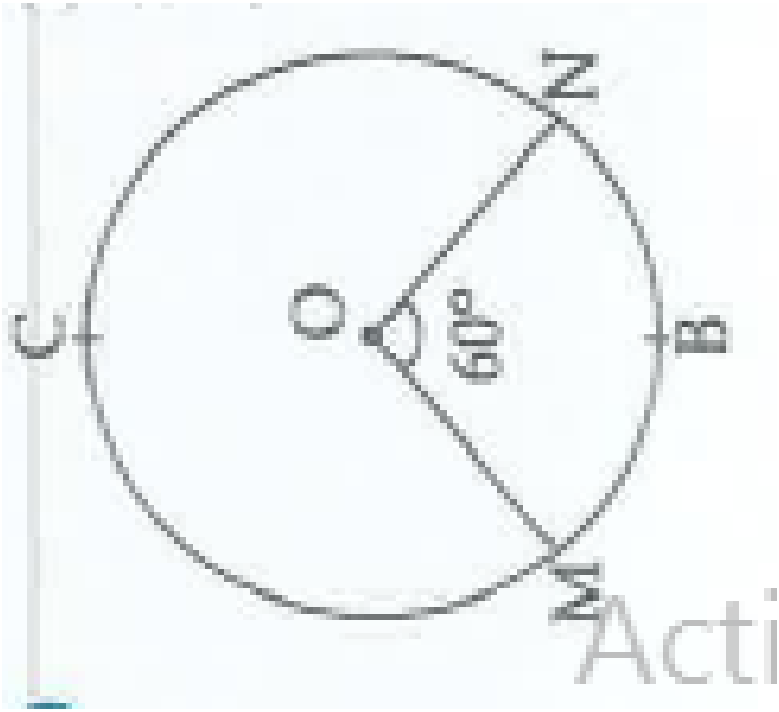
32. In the adjoining figure, the radius of the circle is 7 cm and m (arc MBN) = 60° Find (iii) A (O- MCN)



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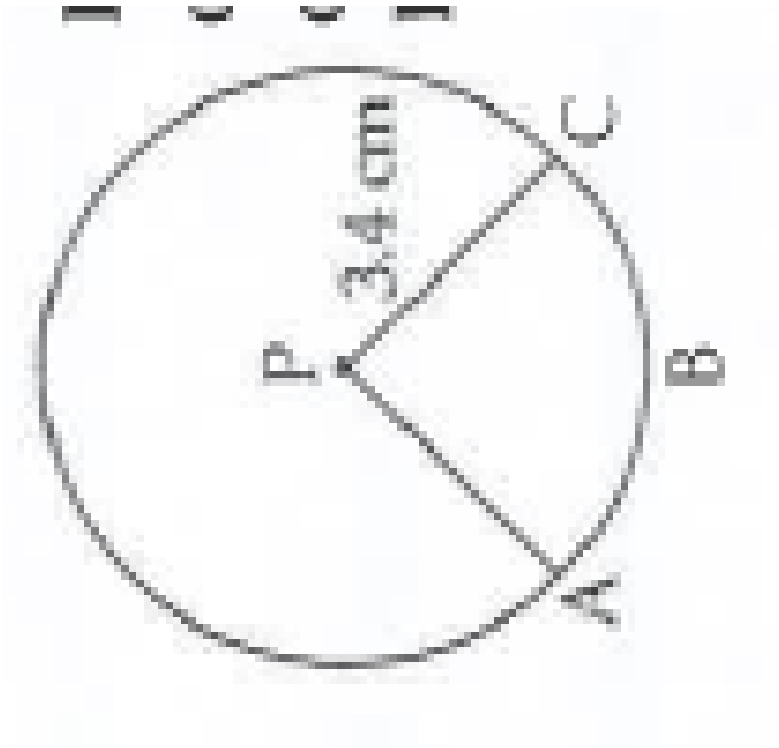
33. In the adjoining figure, radius of circle is 3.4 cm and perimeter of sector P-ABC is 12.8 cm. Find A (P-ABC).



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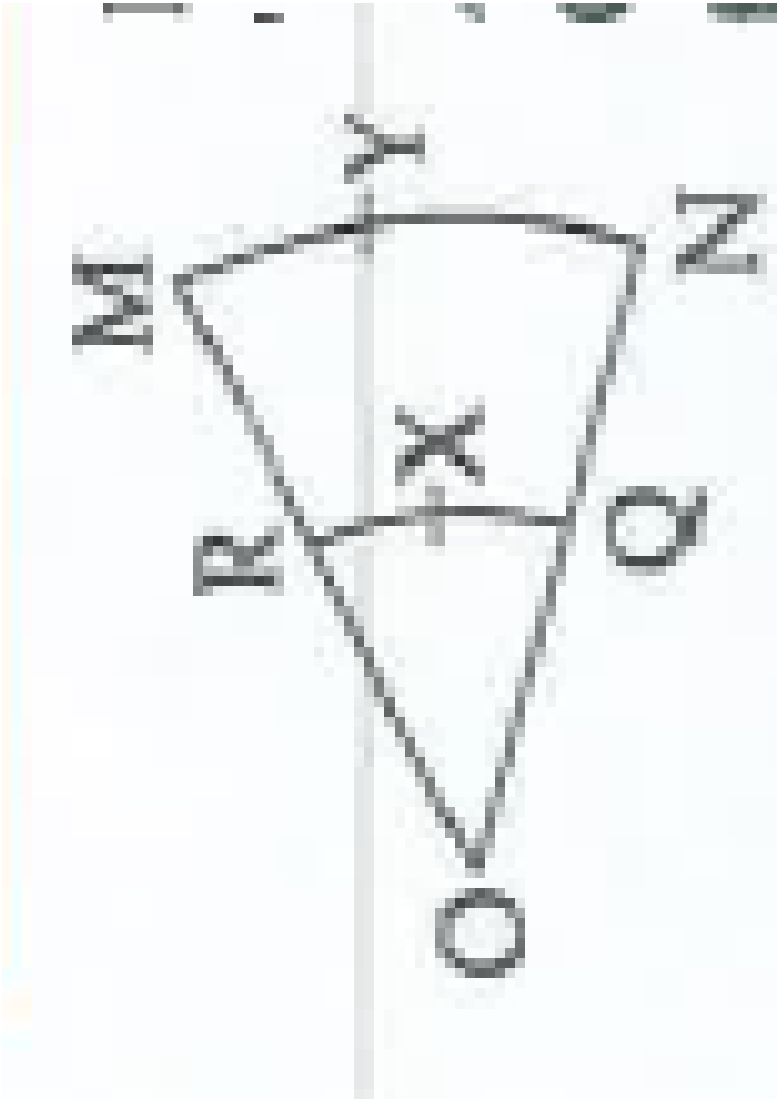
34. In the adjoining figure, 'O' is centre of arcs.

$\angle ROQ$ = $\angle MON$ = 60°, OR = 7 cm, OM =21cm.

Find the lengths of arc RXQ and arc MYN.

$\left(\pi = \frac{22}{7}\right)$



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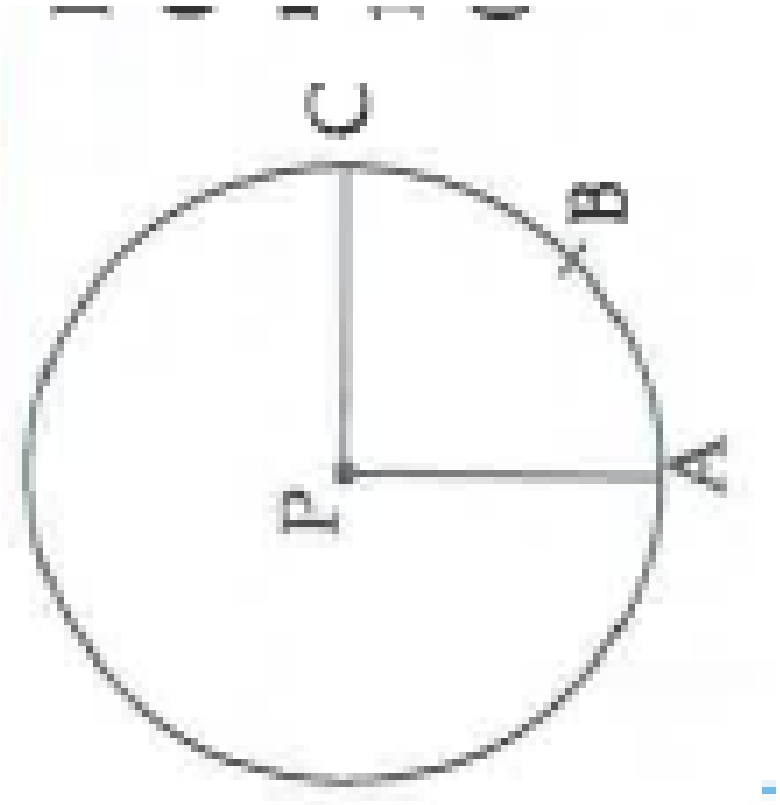
35. In the adjoining figure A (P-ABC) = 154 cm^2 and radius of the circle is 14 cm. Find (i) $\angle APC$



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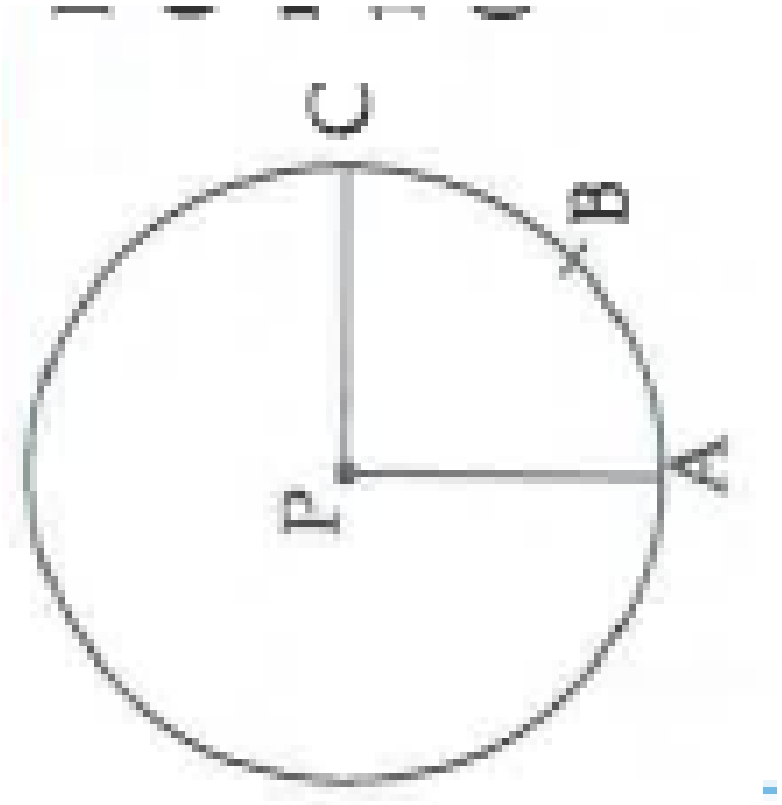
36. In the adjoining figure A (P-ABC) = 154 cm^2 and radius of the circle is 14 cm. Find (ii) l (arc ABC).



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37. Radius of a sector of a circle is 7 cm. If measure of arc of the sector is (1) 30° (2) 210° (3) three right angles, find the area of the sector in each case

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38. The area of a minor sector of a circle is 3.85 cm^2 and the measure of its central angle is 36°. Find the radius of the circle.

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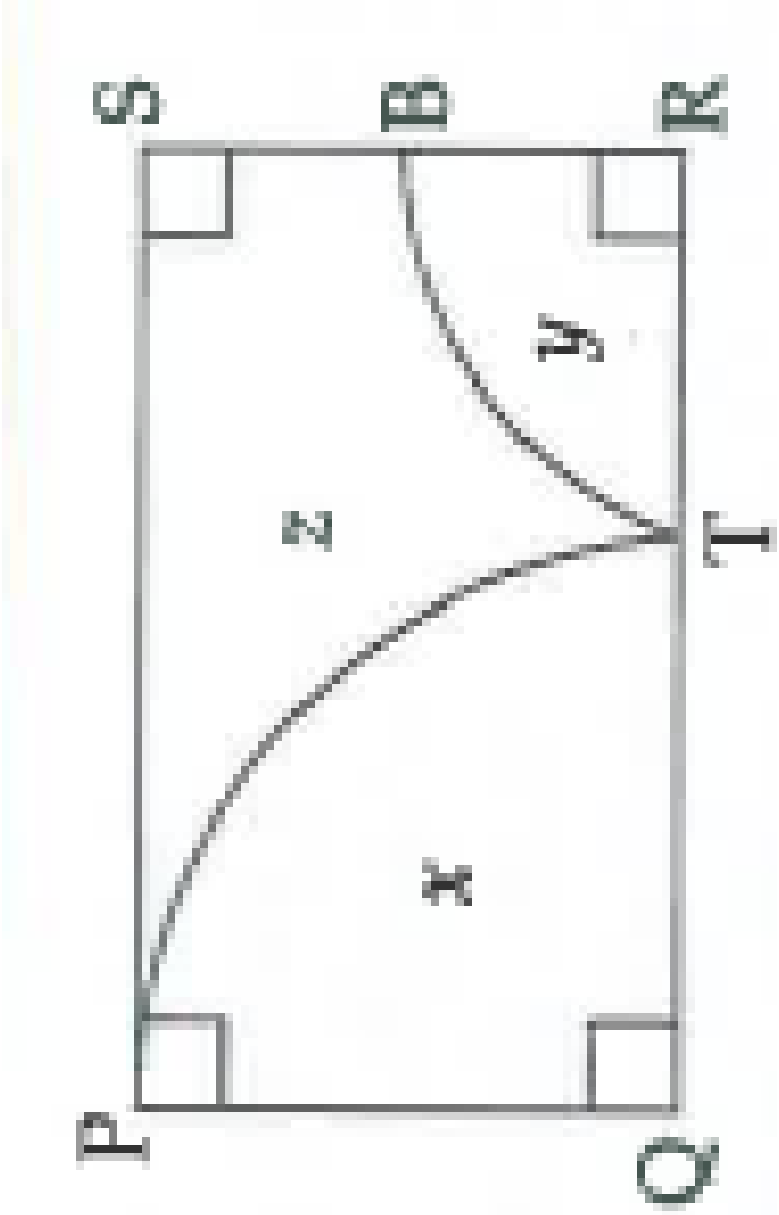
39. In the adjoining figure, □PQRS is a rectangle. PQ = 14 cm, QR = 21 cm, find the

areas of the parts



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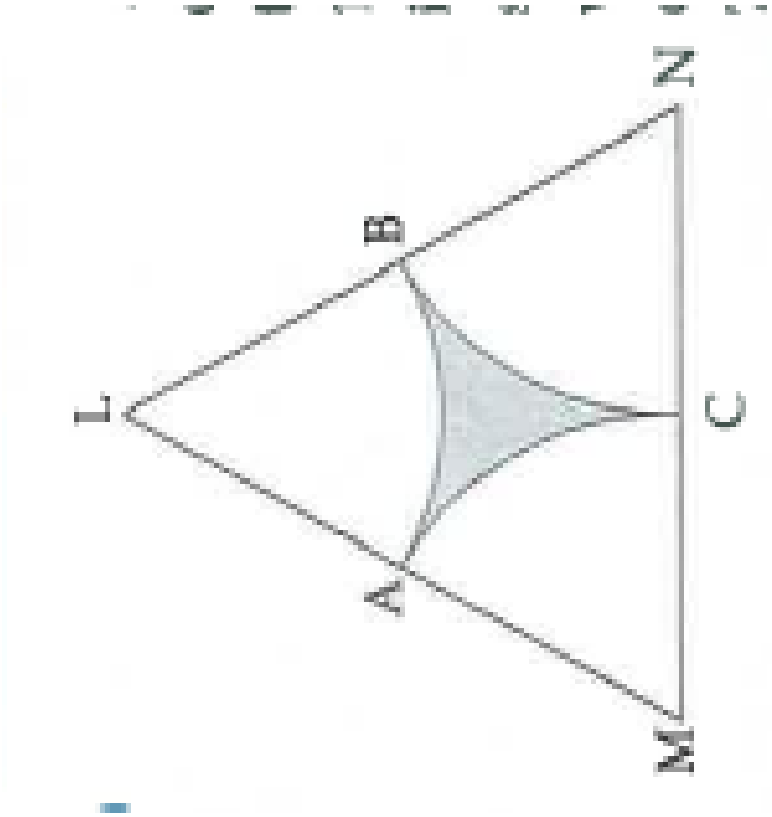
40. $\triangle LMN$ is an equilateral triangle. LM= 14 cm. As shown in the figure, 3 sectors are drawn with vertices as centre and radius 7 cm. Find (i) A ($\triangle LMN$)



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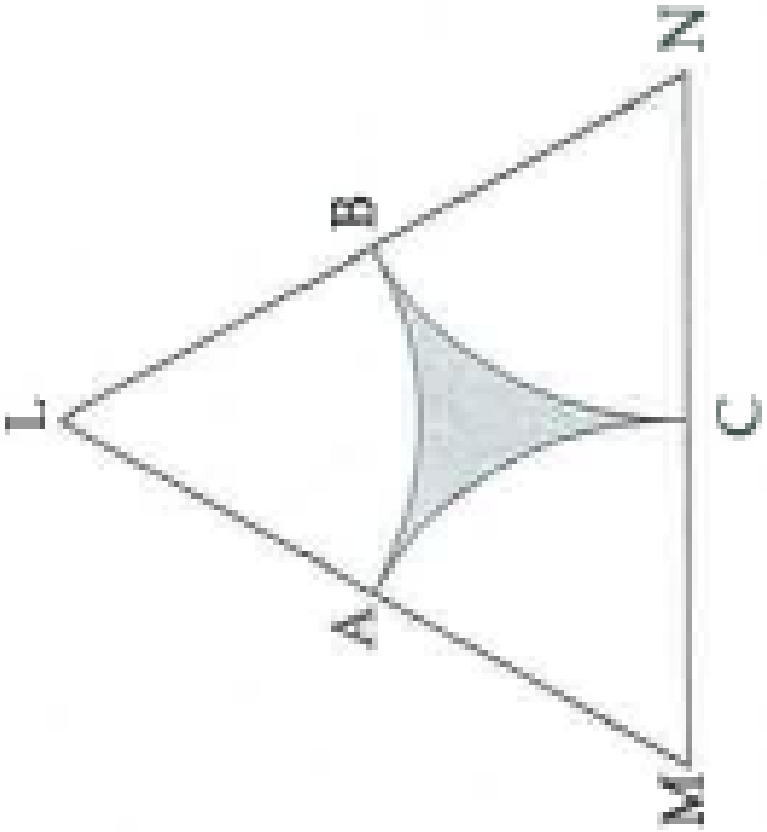
41. $\triangle LMN$ is an equilateral triangle. LM= 14 cm. As shown in the figure, 3 sectors are drawn with vertices as centre and radius 7 cm. Find

(ii) Area of any one of the sectors.



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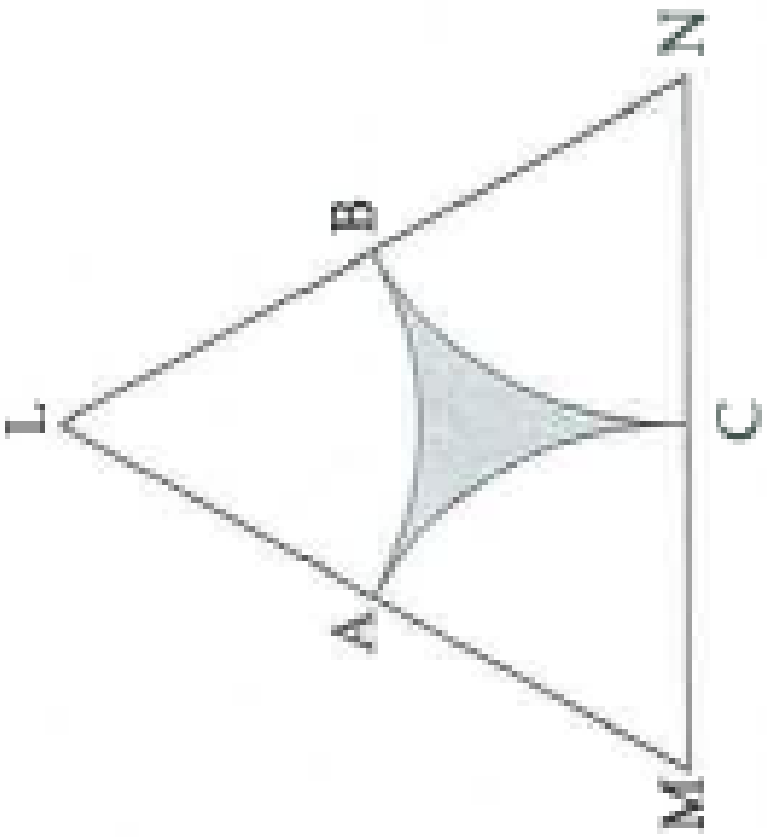
42. $\triangle LMN$is an equilateral triangle. LM= 14 cm. As shown in the figure, 3 sectors are drawn with vertices as centre and radius 7 cm. Find

(iii) Total area of all the three sectors



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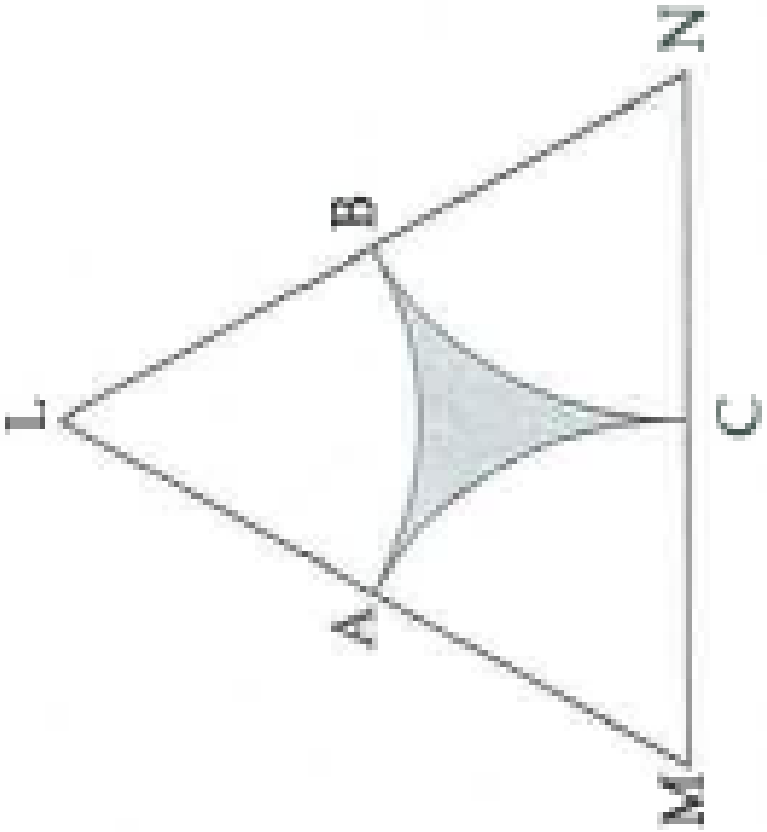
43. $\triangle LMN$ is an equilateral triangle. LM= 14 cm. As shown in the figure, three sectors are drawn with vertices as centre and radius 7 cm.

Find (iv) Area of the shaded region.



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44. The area of a sector of a circle of 6 cm radius is 15π sq. cm. Find the measure of the arc and length of the arc corresponding to the sector.

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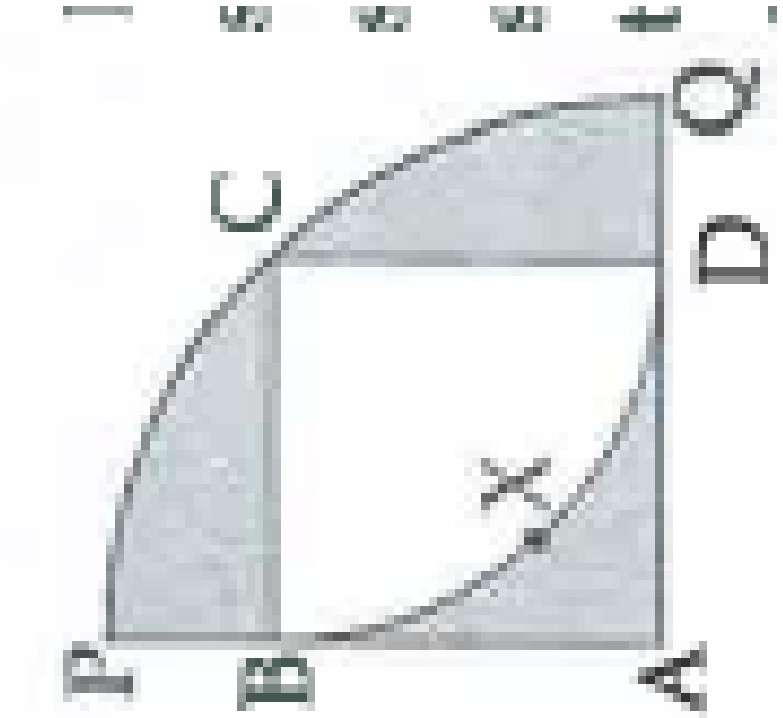
45. In the adjoining figure, square ABCD is inscribed in the sector A-PCQ. The radius of sector C-BXD is 20 cm. Find the area of shaded

region.



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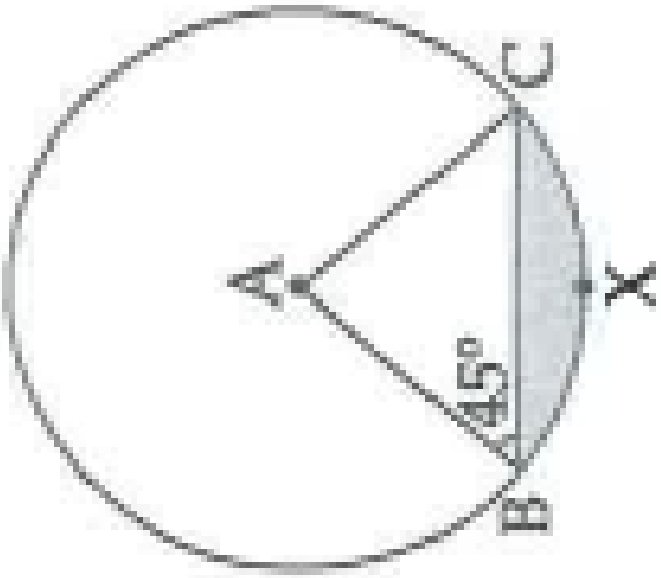
46. In the adjoining figure, A is the centre of the circle. $\angle ABC = 45^\circ$ and AC = $7\sqrt{2}$ cm.

Find the area of segment BXC.

$(\pi = 3.14), (\sqrt{2} = 1.41)$



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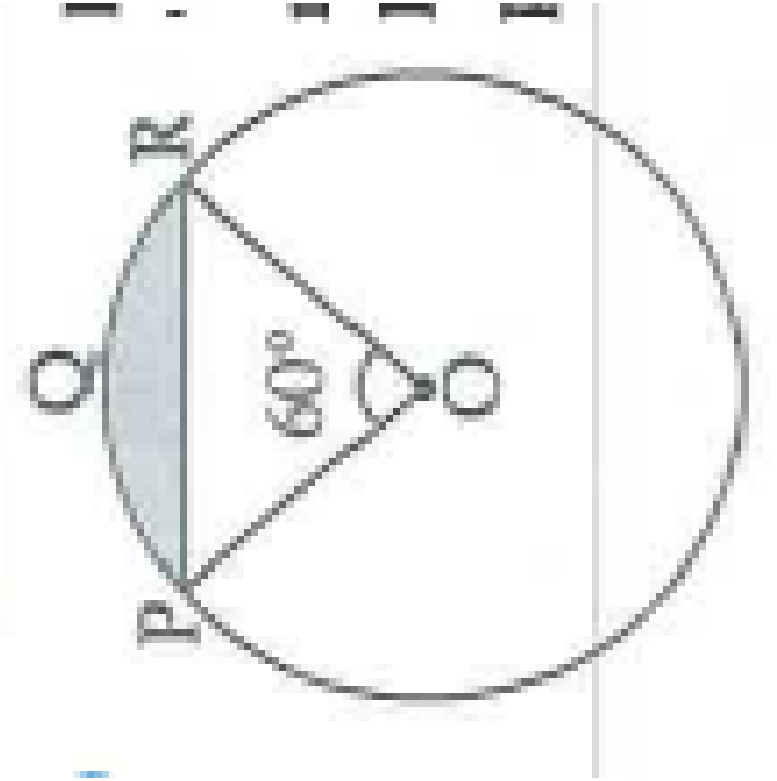
47. In the adjoining figure, point 'O' is the centre of the circle, m (arc PQR) = 60°, OP = 10 cm. Find the area of the shaded portion. $(\pi = 3.14, \sqrt{3} = 1.73)$



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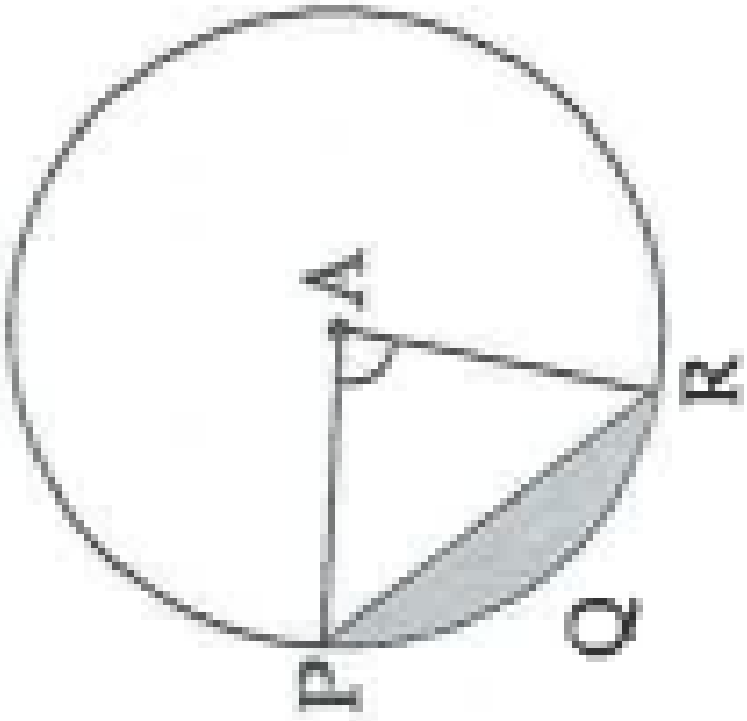
48. In the adjoining figure, if A is the centre of the circle. $\angle PAR$ =30° AP = 7.5, find the area of segment PQR. $(\pi = 3.14)$



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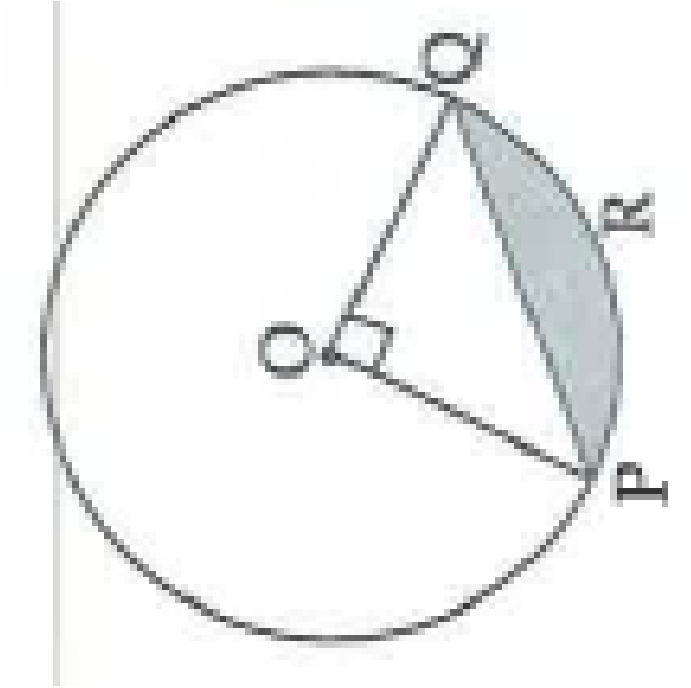
49. In the adjoining figure, if O is the centre of the circle, PQ is a chord. $\angle POQ = 90^\circ$, area of shaded region is 114 cm^2, find the radius of the circle $(\pi = 3.14)$



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50. A chord PQ of circle with radius 15 cm subtends an angle of 60° with the centre of the circle. Find the area of the minor as well as the major segment. $(\pi = 3.14, \sqrt{3} = 1.73)$

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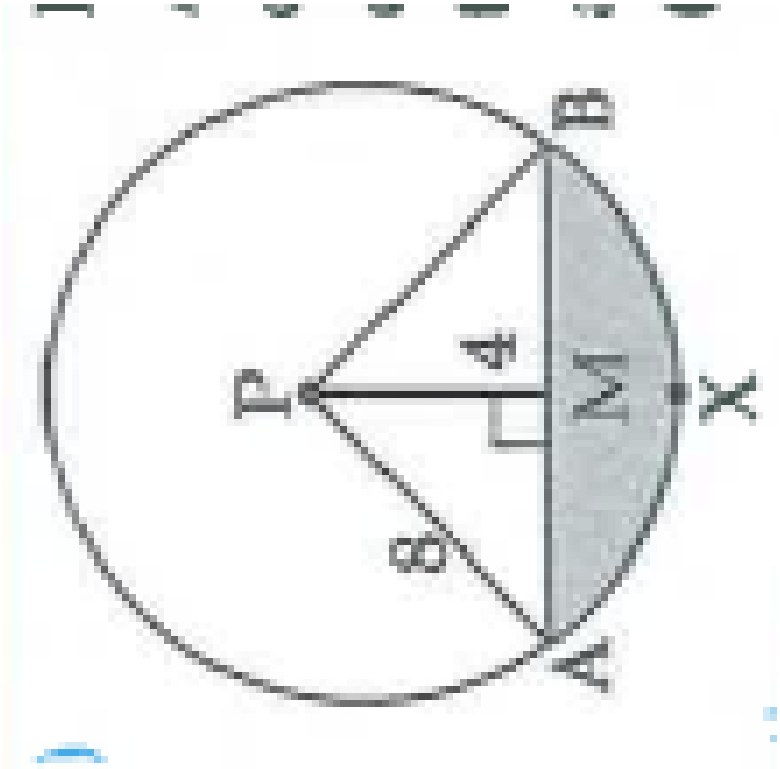
51. In the adjoining figure, seg AB is a chord of a circle with centre P. If PA = 8 cm and distance of chord AB from the centre P is 4 cm, find the

area of the shaded portion.

$(\pi = 3.14. \sqrt{3} = 1.73)$



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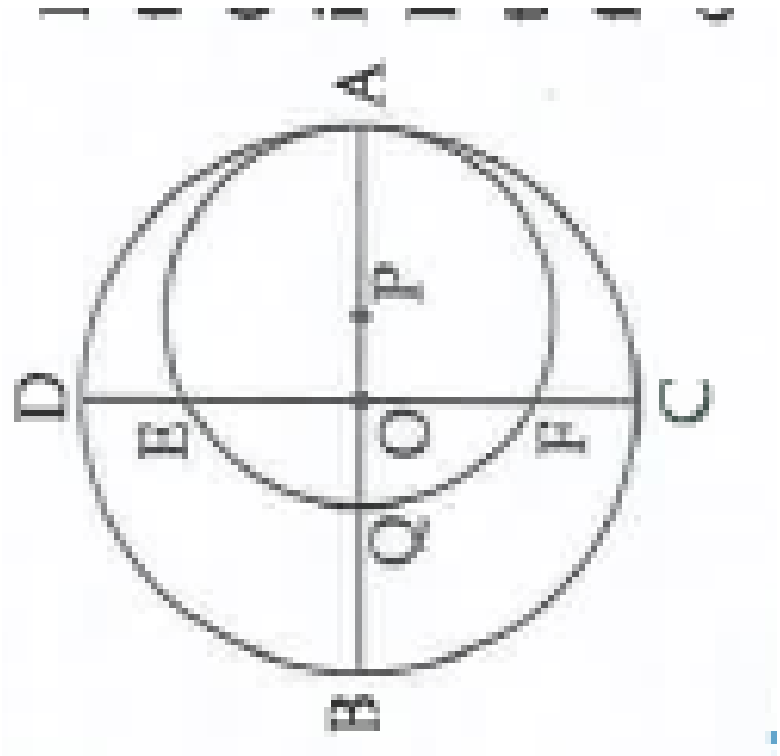
52. In the adjoining figure, two circles with centres O and P are touching internally at point A. If BQ = 9. DE = 5, then find the radii of the circles.



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53. Choose the correct alternative answer for the following question: The ratio of circumference and area of a circle is 2:7. Find its circumference. (A) 14π (B) $\frac{7}{\pi}$ (C) 7π (D) $\frac{14}{\pi}$

A. (A) 14π

B. (B) $\frac{7}{\pi}$

C. (C) 7π

D. (D) $\frac{14}{\pi}$

Answer:

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54. If measure of an arc of circle is 160° and its length is 44 cm, find the circumference of the circle. (A) 66cm (B) 44cm (C) 160cm (D) 99cm

A. (A) 66cm

B. (B) 44cm

C. (C) 160cm

D. (D) 99cm

Answer:

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55. Find the perimeter of a sector of a circle if its measure is 90° and radius is $7cm$. a)$44cm$ b)$25cm$ c)$36cm$ d)$56cm$

A. (A) 440 cm^2

B. (B) 550 cm^2

C. (C) 330 cm^2

D. (D) 110 cm^2

Answer:

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56. The curved surface area of a cylinder is 440 cm^2 and its radius is 5 cm. Find its height.

A. (A) $\frac{44}{\pi}cm$

B. (B) $22\pi cm$

C. (C) $44\pi cm$

D. (D) $\frac{4}{\pi}cm$

Answer:

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57. A cone was melted and cast into a cylinder of the same radius as that of the base of the cone. If the height of the cylinder is 5cm, find the height of the cone.

A. (A) 15 cm

B. (B) 10 cm

C. (C) 18 cm

D. (D) 5 cm

Answer:

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58. Find the volume of a cube of side 0.01 cm.

A. (A) 1 cm^3

B. (B) 0.001 cm^3

C. (C) 0.0001 cm^3

D. (D) 0.00000cm^3

Answer:

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59. Find the side of a cube of volume 1 m^3.

A. (A) 1 cm

B. (B) 10 cm

C. (C) 100 cm

D. (D) 1000 cm

Answer:

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60. Vertical surface area of a cuboid is....

A. (A) 2(l $\times$ b) + h

B. (B) $2(l \times b) \times h$

C. (C) 2(l + b) +h

D. (D) $2(l + b) \times h$

Answer:

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61. Total surface area of a cube is 216 `cm^2. Find its volume.

A. (A) 36 cm^3

B. (B) 100 cm^3

C. (C) 216 cm 3

D. (D) 400 cm^3

Answer:

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62. The length, breadth, height of cuboid are in the ratio 1: 1: 2, its total surface area is 1000 cm^2. Therefore, its length is....(A) 10 cm (B) 15 cm (D) 20 cm (D) 12 cm

A. (A) 10 cm

B. (B) 15 cm

C. (D) 20 cm

D. (D) 12 cm

Answer:

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63. A tent is made up of cylinder and mounted by a conical top. In order to calculate its total surface area, find sum of their....(A) Volumes (B) Total surface areas (C) Curved surface areas (D) Base areas

A. (A) Volumes

B. (B) Total surface area

C. (C) Curved surface area

D. (D) Base areas

Answer:

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64. If diameter of a semicircle is 35 cm, then find its arc length. (A) 55 cm (B) 110cm (C) 90 cm (D) 70 cm

A. (A) 110 cm

B. (B) 55cm

C. (C) 90 cm

D. (D) 70 cm

Answer:

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65. Q.1. (A) Choose the correct alternative answer for the following: (1) If r = 7 cm and $\theta = 180^\circ$. Length of arc is.....(A) 44 cm (B) 22 cm (C) 10 cm (D) 18 cm

A. (A) 44 cm

B. (B) 22 cm

C. (C) 10 cm

D. (D) 18cm

Answer:

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66. If r =7 cm and $\theta = 36^\circ$, then area of sector is.....

A. (A) 15.4 cm^2

B. (B) 20.36 cm^2

C. (C) 10.46 CM^2

D. (D) 18.2 cm^2

Answer:

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67. Bricks of dimensions $15cm \times 8cm \times 5cm$ are used to build a wall of dimensions $120cm \times 16cm \times 200cm$. How many bricks are used?

A. (A) 1280

B. (B) 640

C. (C) 160cm

D. (D) 320

Answer:

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68. If the volume of cylinder is 12436 cm^3 and radius and height of cylinder are in the ratio 2: 3, find its height. (A) 21 cm (B) 7 cm (C) 14 cm (D) 18 cm

A. (A) 21 cm

B. (B) 7 cm

C. (C) 14 cm

D. (D) 18 cm

Answer:

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69. Find the volume of a right circular cone if r = 14 cm and h = 9 cm.

A. (A) 161 cm^3

B. (B) 2438 cm^3

C. (C) 1848 cm^3

D. (D) 1488 cm^3

Answer:

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70. The volume of two spheres are in the ration 8:27, find the ratio of their radii. (A) 2:3 (B) 2:9 (C) 1:3 (D) 4:9

A. (A) 2:3

B. (B) 2:9

C. (C) 1:3

D. (D) 4:9

Answer:

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71. Two cubes each with 12 cm edge, are joined end to end. Find the surface area of the resulting cuboid.

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72. A solid cube with edge 'l' was divided exactly into two equal halves. Find the ratio of the total surface area of the given cube and that of the cuboid formed.

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73. A beam 4 m long, 50 cm wide and 20 cm deep is made of wood, which weighs 25 kg per

m^3. Find the weight of the beam.

A. (A) 10

B. (B) 15

C. (C) 20

D. (D) 25

Answer: (A) 10

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74. A fish tank is in the form of a cuboid, external measures of that cuboid are $80cm \times 40cm \times 30cm$. The base, side faces and back face are to be covered with a coloured paper. Find the area of the paper needed.

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75. The base radii of two right circular cones of the same height are in the ratio 2: 3. Find ratio

their volumes.

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76. If the radius of a sphere is doubled, what will be the ratio of its surface area and volume as to that of the first?

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77. The dimensions of a metallic cuboid are 44 cm $\times$ 42 cm $\times$ 21cm. It is molten and

reacast into a sphere. Find the surface area of the sphere.

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78. If the radii of the conical frustum bucket are 14 cm and 7 cm. If its height is 30 cm, then find (i) Its total surface area

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79. If the radii of the conical frustum bucket are 14 cm and 7 cm, If its height is 30 cm, then find (ii) capacity of the bucket.

80. The slant height of the frustum of the cone is 6.3 cm and the perimeters of its circular bases are 18 cm and 6 cm respectively. Find curved surface area of the frustum.

81. The radii of the circular ends of a frustum of a cone are 14 cm and 8 cm. If the height of the frustum is 8 cm. Find (i) Curved surface area of the frustum

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82. The radii of the circular ends of a frustum of a cone are 14 cm and 8 cm, if the height of the frustum is 8 cm. Find (ii) Total surface area of the frustum

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83. The radii of the circular ends of a frustum of a cone are 14 cm and 8 cm, if the height of the frutum is 8 cm. Find (iii) Volume of the frustum.

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84. The curved surface area of the frustum of a cone is 180 sq cm and the circumference of its

circular bases are 18 cm and 6 cm respectively. Find the slant height of the frustum of a cone.

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85. A sector of a circle with radius 10 cm has central angle 72°. Find the area of the sector $(\pi = 3.14)$

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86. If the area of a sector is $\frac{1}{12}$th of the area of the circle, then what is the measure of the corresponding central angle.

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87. In a clock, the minute hand is of length 14 cm. Find the area covered by the minute hand in 5 minutes.

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88. The radius of the circle is 3.5 cm and the area of sector is 3.85 sq cm. Find the measure of the arc of the circle.

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89. Find the area of the sector of a circle of radius 6 cm and arc with length 15 cm.

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90. Find the length of the arc of the circle of diameter 8.4 cm with area of the sector 18.48 cm^2. Also find measure of the arc.

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91. Find the area of minor segment of a circle of radius 6 cm when its chord subtends an angle of 60° at its centre. ($\sqrt{3} = 1.73$)

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92. Area of segment PRQ is 114 sq cm. Chord PQ subtends centre angle $\angle POQ$ measuring 90°. Find the radius of the circle. $(\pi = 3.14)$

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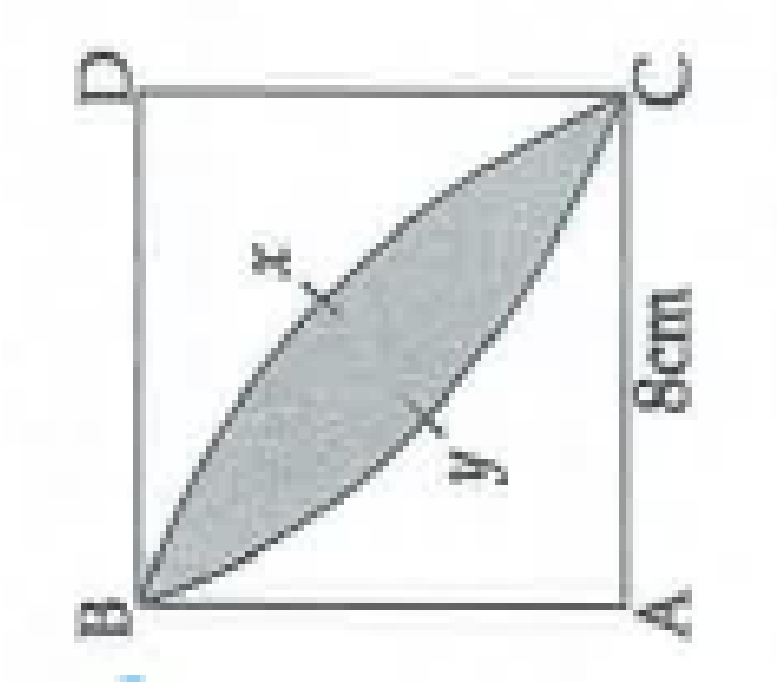
93. In the adjoining figure, arc BXC and arc BYC are drawn with radius 8 cm and centres as point A and D respectively. Find the area of shaded region if $\square$ ABCD is a square with side

8 cm.



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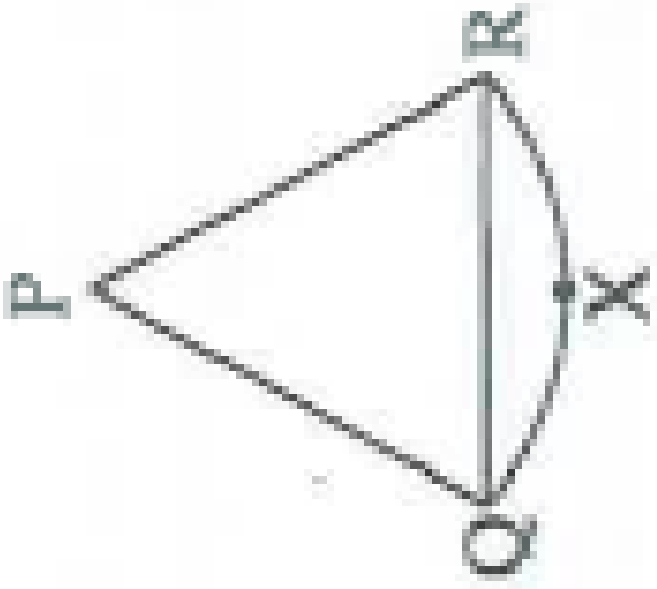
94. In the adjoining figure, P is the centre of the circle with radius 18 cm. If the area of the

$\triangle PQR$ is 100 cm^2, find the central $\angle QPR$.



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95. Q.1. (A) Choose the correct alternative answer for the following: (1) If r = 7 cm and

$\theta = 180^\circ$. Length of arc is.....(A) 44 cm (B) 22 cm (C) 10 cm (D) 18 cm

A. (A) 44 cm

B. (B) 22 cm

C. (C) 10 cm

D. (D) 18 cm

Answer:

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96. The volume of two spheres are in the ration 8:27, find the ratio of their radii. (A) 2:3 (B) 2:9 (C) 1:3 (D) 4:9

A. (A) 2:3

B. (B) 2:9

C. (C) 1:3

D. (D) 4:9

Answer:

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97. Attempt the following : (1) Find the area of a circle with radius 7 cm.

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98. Length of arc of a circle, with radius 5 cm, is 10 cm. Find the area of corresponding sector.

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99. Find the volume of the shpere of diameter 6 cm. $(\pi = 3.14)$

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100. If the radius of a sphere is doubled, what will be the ratio of its surface area and volume as to that of the first?

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101. Q.3. Attempt any two of the following: (1) The radius of a circle with centre P is 10 cm. If chord AB of the circle substends a righ areas of minor segment and the major segment $(\pi = 3.14)$

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102. The diameter and length of a roller is 120 cm and 84 cm respectively. To level the ground, 200 rotations of the roller are required. Find

the expenditure to level the ground at the rate of ~ 10 per sq. m.

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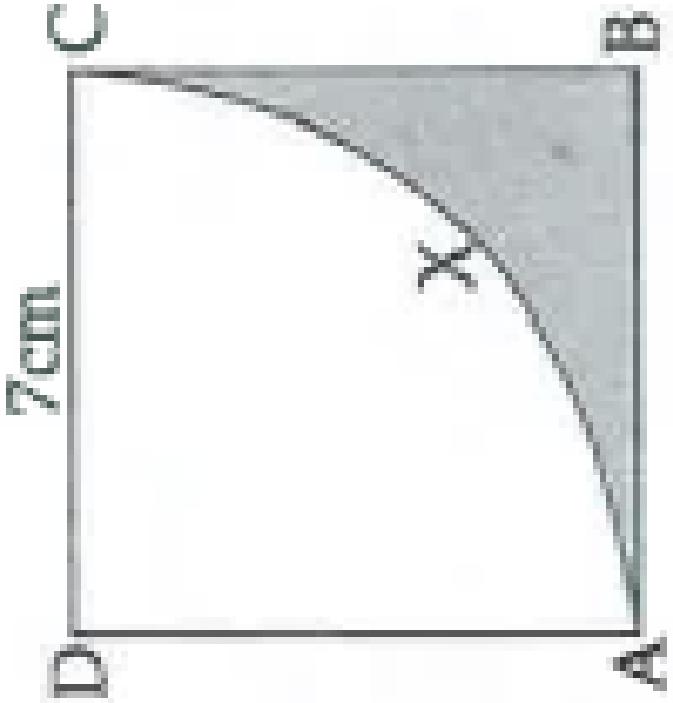
103. In the adjoining figure, $\square ABCD$ os a square with side 7 cm. With centre D and radius DA, sector D -AXC is drawn. Find the

area of shaded portion.



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104. Q.4. Attempt any two of the following: (1) A regular hexagon is inscribed in a circle of radius 14 cm. Find the area of the region between the circle and the hexagon.

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105. The radius of a metallic sphere is 9 cm. It was melted to make a wire of diameter 4 mm. Find the length of the wire.

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106. The radius and height of cylindrical water reservoir is 2.8 m and 3.5 m respectively. How much maximum water can the tank hold? A person needs 70 liters ofr water per day. For how many persons is the water sufficient for a day? $\left(\pi = \frac{22}{7}.\right)$.

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107. A tin maker converts a cubical metallic box into 10 cylindrical tins. Side of the cube is 50

cm and radius of the cylinder is 7 cm. Find the height of each cylinder so made if the wastage incurred was 12%. $\left(\pi = \frac{22}{7}\right)$

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108. The three faces, A, B, C having a common vertex of a cuboid have areas 450 cm^2, 600 cm^2 and 300 cm^2 respectively. Find the volume of the cuboid.

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109. Oil tins of cuboidal shape are made from a metallic sheet with length 8 m and breadth 4 m. Each tin has dimensions $60 \times 40 \times 20$ in cm and is open from the top. Find the number of such tins that can be made?

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110. Plastic drum of cylindrical shape is made by melting shperical solid plastic balls of radius 1 cm. Find the number of balls required

to make a drum of thickness 2 cm, height 90 cm and outer radius 30 cm.

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111. Water drips from a tap at the rate of 4 drops in every 3 seconds. Volume of one drop of 0.4 cm^3, If dripped water is collected in a cylinder vessel of height 7 cm and diameter is 8 cm. In what times vessel be completely filled? What is the bolume of water collected? How

many such vessels will be completely filled in 3 hours in 40 minutes?

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112. A cone and a hemisphere have equal bases and equal volumes. Find the ratio of their heights.

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113. A shpere and a cube have the same surface area. Show that the ratio of the volume of the sphere to that of cube is $\sqrt{6}:\sqrt{\pi}$.

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114. ₹ 5 coins were made by melting a soild cuboidal block of metal with dimensions $16 \times 11 \times 10$ in cm. How many coins of

thickness 2 mm and diameter 2 cm can be made. $\left(\pi = \frac{22}{7}\right)$

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115. If the radius of a shpere is doubled, what will be the ratio of its surface area and volume as to that of the first shpere?

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