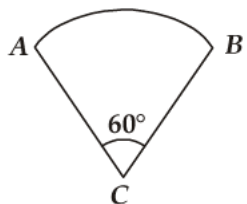
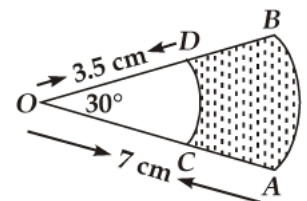


- Q1.** Find the circumference and area of a circle of radius 8.4 m.
- Q2.** Find the area of a circle whose circumference is 22 cm.
- Q3.** Find the area of a quadrant of a circle whose circumference is 22 cm.
- Q4.** If the perimeter of a semi-circular protractor is 108 cm, find the diameter of the protractor (Take  $\pi = 22/7$ ).
- Q5.** Find the circumference of a circle whose area is  $301.84 \text{ cm}^2$ .
- Q6.** Find the area of a circle whose circumference is 44 cm.
- Q7.** What is the ratio of the areas of a circle and an equilateral triangle whose diameter and a side are respectively equal?
- Q8.** What is the angle subtended at the centre of a circle of radius 6 cm by an arc of length  $3\pi \text{ cm}$ ?
- Q9.** What is the area of a sector of a circle of radius 5 cm formed by an arc of length 3.5 cm?
- Q10.** In a circle of radius 10 cm, an arc subtends an angle of  $108^\circ$  at the centre. What is the area of the sector in terms of  $\pi$ ?
- Q11.** Find the area of the sector of a circle whose radius is 14 cm and angle of sector is  $45^\circ$ .
- Q12.** A pendulum swings through an angle of  $30^\circ$  and describes an arc 8.8 cm in length. Find the length of the pendulum.
- Q13.** Find the angle subtended at the centre of a circle of radius 5 cm by an arc of length  $(5\pi/3) \text{ cm}$ .
- Q14.** An arc of length  $20\pi \text{ cm}$  subtends an angle of  $144^\circ$  at the centre of a circle. Find the radius of the circle.
- Q15.** The area of a sector of a circle of radius 5 cm is  $5\pi \text{ cm}^2$ . Find the angle contained the sector.
- Q16.** The area of a sector of a circle of radius 2 cm is  $\pi \text{ cm}^2$ . Find the angle contained the sector.
- Q17.** A sector of a circle of radius 8 cm contains an angle of  $135^\circ$ . Find the area of sector.
- Q18.** A sector of a circle of radius 4 cm contains an angle of  $30^\circ$ . Find the area of sector.
- Q19.** An arc of length 15 cm subtends an angle of  $45^\circ$  at the centre of a circle. Find in terms of  $\pi$ , the radius of the circle.
- Q20.** If the adjoining figure is a sector of a circle of radius 10.5 cm, what is the perimeter of the sector? (Take  $\pi = 22/7$ )
- 
- Q21.** If the diameter of semi-circular protractor is 14 cm, then find its perimeter.
- Q22.** If the circumference and the area of a circle are numerically equal, then diameter of the circle is
- (a)  $\frac{\pi}{2}$                       (b)  $2\pi$                       (c) 2                      (d) 4

- Q23.** If the difference between the circumference and radius of a circle is 37 cm, then using  $\pi = \frac{22}{7}$ , the circumference (in cm) of the circle is  
 (a) 154 (b) 44 (c) 14 (d) 7
- Q24.** The circumference of a circle is 100 cm. The side of a square inscribed in the circle is  
 (a)  $50\sqrt{2}$  cm (b)  $\frac{100}{\pi}$  cm (c)  $\frac{50\sqrt{2}}{\pi}$  cm (d)  $\frac{100\sqrt{2}}{\pi}$  cm
- Q25.** A circular park has a path of uniform width around it. The difference between the outer and inner circumferences of the circular path is 132 m. Its width is  
 (a) 20 m (b) 21 m (c) 22 m (d) 24 m
- Q26.** If a wire is bent into the shape of a square, then the area of the square is  $81 \text{ cm}^2$ . When wire is bent into a semi-circular shape, then the area of the semi-circular shape, then the area of the semi-circle will be  
 (a)  $22 \text{ cm}^2$  (b)  $44 \text{ cm}^2$  (c)  $77 \text{ cm}^2$  (d)  $154 \text{ cm}^2$
- Q27.** A wire can be bent in the form of a circle of radius 56 cm. If it is bent in the form of a square, then its area will be  
 (a)  $3520 \text{ cm}^2$  (b)  $6400 \text{ cm}^2$  (c)  $7744 \text{ cm}^2$  (d)  $8800 \text{ cm}^2$
- Q28.** If the radius of a circle is diminished by 10%, then its area is diminished by  
 (a) 10% (b) 19% (c) 20% (d) 36%
- Q29.** If the circumference of a circle increases from  $4\pi$  to  $8\pi$ , then its area is  
 (a) halved (b) doubled (c) tripled (d) quadrupled
- Q30.** The area of a circle is  $220 \text{ cm}^2$ . The area of a square inscribed in it is  
 (a)  $49 \text{ cm}^2$  (b)  $70 \text{ cm}^2$  (c)  $140 \text{ cm}^2$  (d)  $150 \text{ cm}^2$
- Q31.** The perimeter of a triangle is 30 cm and the circumference of its incircle is 88 cm. The area of the triangle is  
 (a)  $70 \text{ cm}^2$  (b)  $140 \text{ cm}^2$  (c)  $210 \text{ cm}^2$  (d)  $420 \text{ cm}^2$
- Q32.** The area of the largest triangle that can be inscribed in a semi-circle of radius  $r$ , is  
 (a)  $r^2$  (b)  $2r^2$  (c)  $r^3$  (d)  $2r^3$
- Q33.** The area of incircle of an equilateral triangle is  $154 \text{ cm}^2$ . The perimeter of the triangle is  
 (a) 71.5 cm (b) 71.7 cm (c) 72.3 cm (d) 72.7 cm
- Q34.** The area of the incircle of an equilateral triangle of side 42 cm is  
 (a)  $22\sqrt{3} \text{ cm}^2$  (b)  $231 \text{ cm}^2$  (c)  $462 \text{ cm}^2$  (d)  $924 \text{ cm}^2$
- Q35.** The ratio of the areas of a circle and an equilateral triangle whose diameter and a side are respectively equal, is  
 (a)  $\pi : \sqrt{2}$  (b)  $\pi : \sqrt{3}$  (c)  $\sqrt{3} : \pi$  (d)  $\sqrt{2} : \pi$
- Q36.** The area of the largest triangle that can be inscribed in a semi-circle of radius  $r$  is  
 (a)  $2r$  (b)  $r^2$  (c)  $r$  (d)  $\sqrt{r}$
- Q37.** If the area of a square is same as the area of a circle, then the ratio of their perimeters, in terms of  $\pi$ , is  
 (a)  $\pi : \sqrt{3}$  (b)  $2 : \sqrt{\pi}$  (c)  $3 : \pi$  (d)  $\pi : \sqrt{2}$
- Q38.** The area of a circular path of uniform width  $h$  surrounding a circular region of radius  $r$  is  
 (a)  $\pi(2r + h)r$  (b)  $\pi(2r + h)h$  (c)  $\pi(h + r)r$  (d)  $\pi(h + r)h$

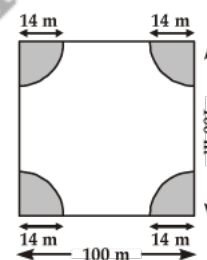
- Q39.** If the difference between the circumference and radius of a circle is 37 cm, then its area is  
 (a)  $154 \text{ cm}^2$  (b)  $160 \text{ cm}^2$  (c)  $200 \text{ cm}^2$  (d)  $150 \text{ cm}^2$
- Q40.** The area of the circle that can be inscribed in a square of side 10 cm is  
 (a)  $40\pi \text{ cm}^2$  (b)  $30\pi \text{ cm}^2$  (c)  $100\pi \text{ cm}^2$  (d)  $25\pi \text{ cm}^2$
- Q41.** If the area of a sector of a circle bounded by an arc of length  $5\pi \text{ cm}$  is equal to  $20\pi \text{ cm}^2$ , then its radius is  
 (a) 12 cm (b) 16 cm (c) 8 cm (d) 10 cm
- Q42.** If the perimeter of a semi-circular protractor is 36 cm, then its diameter is  
 (a) 10 cm (b) 12 cm (c) 14 cm (d) 16 cm
- Q43.** If the area of a sector of a circle is  $\frac{7}{20}$  of the area of the circle, then the sector angle is equal to  
 (a)  $110^\circ$  (b)  $130^\circ$  (c)  $100^\circ$  (d)  $126^\circ$
- Q44.** If the area of a sector of a circle is  $\frac{5}{18}$  of the area of the circle, then the sector angle is equal to  
 (a)  $60^\circ$  (b)  $90^\circ$  (c)  $100^\circ$  (d)  $120^\circ$
- Q45.** If the area of a sector of a circle bounded by an arc of length  $5\pi \text{ cm}$  is equal to  $20\pi \text{ cm}^2$ , then the radius of the circle is  
 (a) 12 cm (b) 16 cm (c) 8 cm (d) 10 cm
- Q46.** If diameter of a circle is increased by 40%, then its area increases by  
 (a) 96% (b) 40% (c) 80% (d) 48%
- Q47.** The area of a sector whose perimeter is four times its radius  $r$  units, is  
 (a)  $\frac{r^2}{4}$  sq. units (b)  $2r^2$  sq. units (c)  $r^2$  sq. units (d)  $\frac{r^2}{2}$  sq. units
- Q48.** ABCD is a rectangle whose three vertices are B (4, 0), C (4, 3) and D (0, 3). The length of one of its diagonals is  
 (a) 5 (b) 4 (c) 3 (d) 25
- Q49.** If  $\pi$  is taken as  $\frac{22}{7}$ , the distance (in metres) covered by a wheel of diameter 35 cm, in one revolution, is  
 (a) 2.2 (b) 1.1 (c) 9.625 (d) 96.25
- Q50.** If the area of a circle is equal to the sum of the areas of two circles of diameters 10 cm and 24 cm, then diameter of the larger circle (in cm) is  
 (a) 34 (b) 26 (c) 17 (d) 14
- Q51.** If area of a circle inscribed in an equilateral triangle is  $48\pi$  square units, then perimeter of the triangle is  
 (a)  $17\sqrt{3}$  units (b) 36 units (c) 72 units (d)  $48\sqrt{3}$  units
- Q52.** The circumference of a circle exceeds the diameter by 16.8. Find the radius of the circle.
- Q53.** The sum of the radii of two circles is 140 cm and the difference of their circumferences is 88 cm. Find the diameters of the circles.
- Q54.** The side of a square is 10 cm. Find the area of circumscribed and inscribed circles.
- Q55.** The circumference of two circles are in the ratio 2 : 3. Find the ratio of their areas.
- Q56.** A horse is placed for grazing inside a rectangular field 40 m by 36 m and is tethered to one corner by a rope 14 m long. Over how much area can it graze? (Take  $\pi = \frac{22}{7}$ )

- Q57.** A steel wire when bent in the form of a square encloses an area of  $121 \text{ cm}^2$ . If the same wire is bent in the form of a circle, find the area of the circle.
- Q58.** The circumference of a circle exceeds the diameter by 16.8 cm. Find the circumference of the circle.
- Q59.** The diameter of the driving wheel of a bus is 140 cm. How many revolutions per minute must the wheel make in order to keep a speed of 66 km per hour?
- Q60.** A boy is cycling such that the wheels of the cycle are making 140 revolutions per minute. If the diameter of the wheel is 60 cm. calculate the speed per hour with which the boy is cycling.
- Q61.** A wheel has diameter 84 cm. Find how many complete revolutions must it take to cover 792 meters.
- Q62.** A bicycle wheel makes 5000 revolutions in moving 11 km. Find the diameter of the wheel.
- Q63.** The inner circumference of a circular track is 220 m. The track is 7 m wide everywhere. Calculate the cost of putting up a fence along the outer circle at the rate of Rs. 2 per metre. (Use  $\pi = 22/7$ )
- Q64.** A race track is in the form of a ring whose inner circumference is 352 m, and the outer circumference is 396 m. Find the width of the track.
- Q65.** A wire is looped in the form of a circle of radius 28 cm. It is re-bent into a square form. Determine the length of the side of the square.
- Q66.** A copper wire, when bent in the form of a square, encloses an area of  $484 \text{ cm}^2$ . If the same wire is bent in the form of a circle, find the area enclosed by it. (Use  $\pi = 22/7$ )
- Q67.** A sector is cut from a circle of radius 21 cm. The angle of the sector is  $150^\circ$ . Find the length of its arc and area.
- Q68.** If a square is inscribed in a circle, what is the ratio of the areas of the circle and the square?
- Q69.** If the circumference of two circles are in the ratio 2 : 3, what is the ratio of their areas?
- Q70.** If a square is inscribed in a circle, find the ratio of the areas of the circle and the square.
- Q71.** The area enclosed between the concentric circles is  $770 \text{ cm}^2$ . If the radius of the outer circle is 21 cm, find the radius of the inner circle.
- Q72.** The area of a circle inscribed in an equilateral triangle is  $154 \text{ cm}^2$ . Find the perimeter of the triangle. (Use  $\pi = 22/7$  and  $\sqrt{3} = 1.73$ )
- Q73.** In figure, there are shown sectors of two concentric circles of radii 7 cm and 3.5 cm. Find the area of the shaded region. (Use  $\pi = 22/7$ )



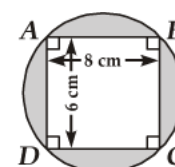
- Q74.** The length of minute hand of a clock is 14 cm. Find the area swept by the minute hand in one minute. (Use  $\pi = 22/7$ )
- Q75.** The perimeter of a sector of a circle of radius 5.2 cm is 16.4 cm. Find the area of the sector.
- Q76.** The minute hand of a clock is 10 cm long. Find the area of the face of the clock described by the minute hand between 9 A.M. and 9.35 A.M.
- Q77.** AB is a chord of a circle with centre O and radius 4 cm. AB is of length 4 cm. Find the area of the sector of the circle formed by chord AB.
- Q78.** An arc of a circle is of length  $5\pi \text{ cm}$  and the sector it bounds has an area of  $20\pi \text{ cm}^2$ . Find the radius of the circle.

- Q79.** Find the area of the sector of a circle with radius 4 cm and of angle  $30^\circ$ . Also, find the area of the corresponding major sector. (Use  $\pi = 3.14$ )
- Q80.** The short and long hands of a clock are 4 cm and 6 cm long respectively. Find the sum of distances travelled by their tips in 2 days. (Take  $\pi = 22/7$ )
- Q81.** The minute hand of a clock is 10 cm long. Find the area of the face of the clock described by the minute hand between 8 A.M. and 8.25 A.M.
- Q82.** The minute hand of a clock is  $\sqrt{21}$  cm long. Find the area described by the minute hand on the face of the clock between 7.00 A.M. and 7.05 A.M.
- Q83.** A sector is cut-off from a circle of radius 21 cm. The angle of the sector is  $120^\circ$ . Find the length of its arc and the area.
- Q84.** The perimeter of a certain sector of a circle of radius 5.6 m is 27.2 m. Find the area of the sector.
- Q85.** The perimeter of a sector of a circle of radius 5.7 m is 27.2 m. Find the area of the sector.
- Q86.** In a circle of radius 35 cm, an arc subtends an angle of  $72^\circ$  at the centre. Find the length of the arc and area of the sector.
- Q87.** A paper is the form of a rectangle  $ABCD$  in which  $AB = 20$  cm and  $BC = 14$  cm. A semi-circular portion with  $BC$  as diameter is cut off. Find the area of a remaining part.
- Q88.** A horse is placed for grazing inside a rectangular field 70 m by 52 m and is tethered to one corner by a rope 21 m long. On how much area can it graze?
- Q89.** A drain cover is made from a square metal plate of side 40 cm having 441 holes of diameter 1 cm each drilled in it. Find the area of the remaining square plate.
- Q90.** The area of a sector is one-twelfth that of the complete circle. Find the angle of the sector.
- Q91.**  $AB$  is a chord of a circle with centre  $O$  and radius 4 cm.  $AB$  is of length 4 cm and divides the circle into two segments. Find the area of the minor segment.
- Q92.** A square park has each side of 100 m. At each corner of the park, there is a flower bed in the form of a quadrant of radius 14 m as shown in figure. Find the area of the remaining part of the park (Use  $\pi = 22/7$ )

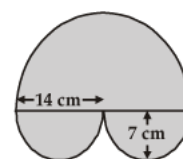


- Q93.** A circular grassy plot of land, 42 m in diameter, has a path 3.5 m wide running round it on the outside. Find the cost of gravelling the path at Rs. 4 per square metre.

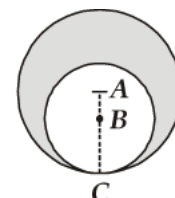
- Q94.** In figure, find the area of the shaded region (Use  $\pi = 3.14$ )



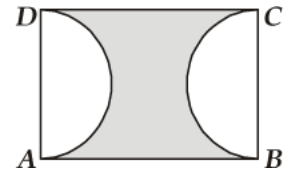
- Q95.** Find the areas of the shaded region in the figure.



- Q96.** In figure, two circles with centres  $A$  and  $B$  touch each other at the point  $C$ . If  $AC = 8$  cm and  $AB = 3$  cm, find the area of the shaded region.



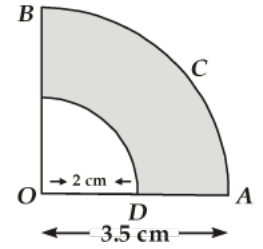
**Q97.** In figure,  $ABCE$  is a rectangle, having  $AB = 20$  cm and  $BC = 14$  cm. Two sectors of  $180^\circ$  have been cut off. Calculate:



- (i) the area of the shaded region.
- (ii) the length of the boundary of the shaded region.

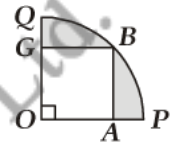
**Q98.** A circular field has a perimeter of 650 m. A square plot having its vertices on the circumference of the field is marked in the field. Calculate the area of the square plot.

**Q99.** In figure,  $OACB$  is a quadrant of a circle with centre  $O$  and radius 3.5 cm. If  $OD = 2$  cm, find the area of the (i) quadrant  $OACB$  (ii) shaded region.



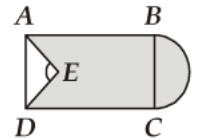
**Q100.** A road which is 7 m wide surrounds a circular park whose circumference is 352 m. Find the area of the road.

**Q101.** In figure, a square  $OABC$  is inscribed in a quadrant  $OPBQ$  of a circle. If  $OA = 21$  cm, find the area of the shaded region.

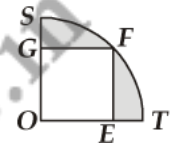


**Q102.** Find the area of the largest triangle that can be inscribed in a semi-circle of radius  $r$  units.

**Q103.** In figure, from a rectangular region  $ABCD$  with  $AB = 20$  cm, a right triangle  $AED$  with  $AE = 9$  cm and  $DE = 12$  cm, is cut off. On the other end, taking  $BC$  as diameter, a semicircle is added on outside the region. Find the area of the shaded region. (USE  $\pi = 22/7$ )



**Q104.** In figure,  $OE = 20$  cm. In sector  $OSFT$ , square  $OEFG$  is inscribed. Find the area of the shaded region.



**Q105.** A field is in the form of a circle. A fence is to be erected around the field. The cost of fencing would be Rs. 2560 at the rate of Rs. 12 per metre. Then, the field is to be thoroughly ploughed at the cost of Re. 0.50 per  $m^2$ . What is the amount required to plough the field? (Take  $\pi = 22/7$ )

**Q106.** Two circles touch externally. The sum of their areas is  $130\pi$  sq. cm. and the distance between their centres is 14 cm. Find the radii of the circles.

**Q107.** Two circles touch internally. The sum of their areas is  $116\pi$   $cm^2$  and distance between their centres is 6 cm. Find the radii of the circles.

**Q108.** A park is in the form of a rectangle 120 m  $\times$  100 m. At the centre of the park there is circular lawn. The area of park excluding lawn is  $8700 m^2$ . Find the radius of the circular lawn. (Use  $\pi = 22/7$ )

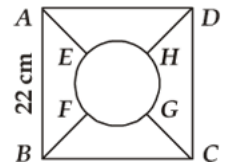
**Q109.** The diameters of the front and rear wheels of a tractor are 80 cm and 2 m respectively. Find the number of revolutions that rear wheel will make to cover the distance which the front wheel covers in 1400 revolutions.

**Q110.** A bucket is raised from a well by means of a rope which is wound round a wheel of diameter 77 cm (see figure). Given that the bucket ascends in 1 minute 20 seconds with a uniform speed of 1.1 m/s. Calculate the number of complete revolutions the wheel makes in raising the bucket.



**Q111.** A path of 4 m width runs round a semi-circular grassy plot whose circumference is  $163\frac{3}{7}$ , find: (i) the area of the path, (ii) the cost of gravelling the path at the rate of Rs. 1.50 per square metre, and (iii) the cost of turfing the plot at the rate of 45 paise per  $m^2$ .

- Q112** In figure, the square  $ABCD$  is divided into five equal parts, all having same area. The central part is circular and the lines  $AE, GC, BF$  and  $HD$  lie along the diagonals  $AC$  and  $BD$  of the square. If  $AB = 22$  cm, find:  
 (i) the circumference of the central part. (ii) the perimeter of the part  $ABEF$ .

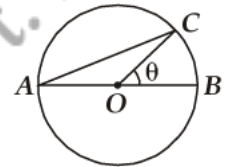


- Q113** In a circle with centre  $O$  and radius 5 cm,  $AB$  is a chord of length  $5\sqrt{3}$  cm. Find the area of sector  $AOB$ .
- Q114** Find the area of the segment of a circle, given that the angle of the sector is  $120^\circ$  and the radius of the circle is 21 cm. (Take  $\pi = 22/7$ )
- Q115** A chord  $AB$  of a circle of radius 10 cm makes a right angle at the centre of the circle. Find the area of the major and minor segments. (Take  $\pi = 3.14$ )
- Q116** A chord  $AB$  of a circle of radius 15 cm makes an angle of  $60^\circ$  at the centre of the circle. Find the area of the major and minor segment. (Take  $\pi = 3.14, \sqrt{3} = 1.73$ )
- Q117** A chord of a circle subtends an angle of  $\theta$  at the centre of the circle. The area of the minor segment cut off by the chord is one eighth of the area of the circle. Prove that

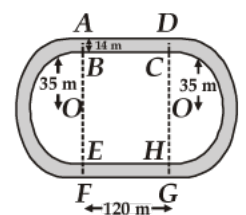
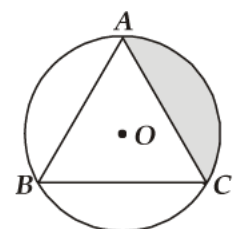
$$8 \sin \frac{\theta}{2} \cos \frac{\theta}{2} + \pi = \frac{\pi\theta}{45}$$

- Q118**  $AB$  is the diameter of a circle, centre  $O$ .  $C$  is a point on the circumference such that  $\angle COB = \theta$ . The area of the minor segment cut off by  $AC$  is equal to twice the area of the sector  $BOC$ . Prove that

$$\sin \frac{\theta}{2} \cos \frac{\theta}{2} = \pi \left( \frac{1}{2} - \frac{\theta}{120} \right)$$

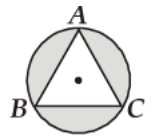


- Q119** A chord  $AB$  of a circle, of radius 14 cm makes an angle of  $60^\circ$  at the centre of the circle. Find the area of the minor segment of the circle. (Use  $\pi = 22/7$ )
- Q120** A chord 10 cm long is drawn in a circle whose radius is  $5\sqrt{2}$  cm. Find area of both the segments. (Take  $\pi = 3.14$ )
- Q121** A chord of a circle of radius 14 cm makes a right angle at the centre. Find the areas of the minor and major segments of the circle.
- Q122** A rectangular piece is 20 m long and 15 m wide. From its four corners, quadrants of radii 3.5 m have been cut. Find the area of the remaining part.
- Q123** The outer circumference of a circular race-track is 528 m. The track is everywhere 14 m wide. Calculate the cost of levelling the track at the rate of 50 paise per square metre (Use  $\pi = 22/7$ ).
- Q124** In figure,  $ABC$  is an equilateral triangle inscribed in a circle of radius 4 cm with centre  $O$ . Find the area of the shaded region.



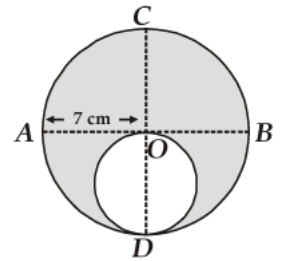
- Q126** In an equilateral triangle of side 24 cm, a circle is inscribed touching its sides. Find the area of the remaining portion of the triangle (Take  $\sqrt{3} = 1.732$ )

**Q127** In figure, an equilateral triangle  $ABC$  of side 6 cm has been inscribed in a circle. Find the area of the shaded region. (Take  $\pi = 3.14$ )



**Q128** Three circles are placed on a plane in such a way that each circle just touches the other two, each having a radius of 10 cm. Find the area of region enclosed by them.

**Q129** In figure,  $AB$  and  $CD$  are two diameters of a circle perpendicular to each other and  $OD$  is the diameter of the smaller circle. If  $OA = 7$  cm, find the area of the shaded region.

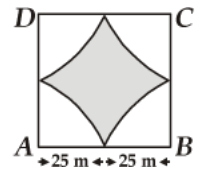


**Q130** A rectangular park is 100 m by 50 m. It is surrounded by semi-circular flower beds all round. Find the cost of levelling the semi-circular flower beds at 60 paise per square metre (Use  $\pi = 2.14$ ).

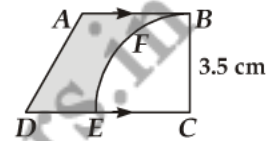
**Q131** A square water tank has its side equal to 40 m. There are four semi-circular grassy plots all round it. Find the cost of turfing the plot at Rs. 1.25 per square metre (Take  $\pi = 3.14$ ).

**Q132** Four equal circles, each of radius  $a$ , touch each other. Show that the area between them is  $\frac{6}{7} a^2$  (Take  $\pi = 3.14$ ).

**Q133** Four cows are tethered at four corners of a square plot of side 50 m, so that they just cannot reach one another. What area will be left ungrazed (see figure)?

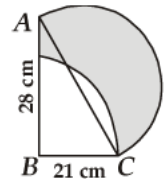


**Q134** From a thin metallic piece, in the shape of a trapezium  $ABCD$ , in which  $AB \parallel CD$  and  $\angle BCD = 90^\circ$ , a quarter circle  $BEFC$  is removed (see figure). Given  $AB = BC = 3.5$  cm and  $DE = 2$  cm, calculate the area of the remaining piece of the metal sheet.

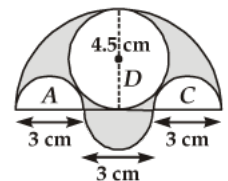


**Q135** Find the area enclosed between two concentric circles of radii 3.5 cm and 7 cm. A third concentric circle is drawn outside the 7 cm circle, such that the area enclosed between it and the 7 cm circle is same as that between the two inner circles. Find the radius of the third circle correct to one decimal place.

**Q136** In figure,  $ABC$  is right-angled triangle,  $\angle B = 90^\circ$ ,  $AB = 28$  cm and  $BC = 21$  cm. With  $AC$  as diameter a semi-circle is drawn and with  $BC$  as radius a quarter circle is drawn. Find the area of the shaded region correct to two decimal places.



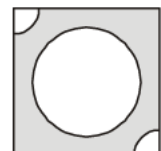
**Q137** In figure, there are three semicircles,  $A$ ,  $B$  and  $C$  having diameter 3 cm each, and another semicircle  $E$  having a circle  $D$  with diameter 4.5 cm are shown. Calculate:



- the area of the shaded region.
- the cost of painting the shaded region at the rate of 25 paise per  $\text{cm}^2$ , to the nearest rupee.

**Q138** A circular pond is of diameter 17.5 m. It is surrounded by a 2m wide path. Find the cost of constructing the path at the rate of Rs. 25 per square metre (Use  $\pi = 3.14$ )

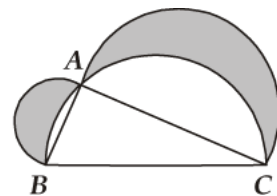
**Q139** From each of the two opposite corners of a square of side 8 cm, a quadrant of a circle of radius 1.4 cm is cut. Another circle of radius 4.2 cm is also cut from the centre as shown in figure. Find the area of the remaining (shaded) portion of the square. (Use  $\pi = 22/7$ )



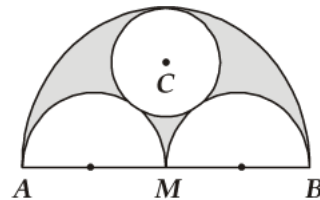


**Q140** In a circle of radius 21 cm, an arc subtends an angle of  $60^\circ$  at the centre. Find (i) the length of the arc  
(ii) area of the sector formed by the arc. (Use  $\pi = 22/7$ )

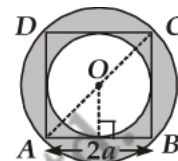
**Q141** In figure,  $ABC$  is a right angled triangle in which  $\angle A = 90^\circ$ ,  $AB = 21$  cm and  $AC = 28$  cm. Semi-circles are described on  $AB$ ,  $BC$  and  $AC$  as diameters. Find the area of the shaded region.



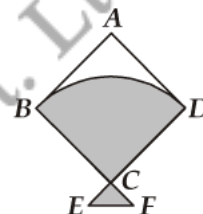
**Q142** In figure,  $AB = 36$  cm and  $M$  is mid-point of  $AB$ . Semicircles are drawn on  $AB$ ,  $AM$  and  $MB$  as diameters. A circle with centre  $C$  touches all the three circles. Find the area of the shaded region.



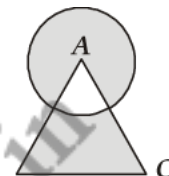
**Q143** In figure,  $ABCD$  is a square of side  $2a$ . Find the ratio between  
(i) the circumferences.  
(ii) the areas of the incircle and the circum-circle of the square.



**Q144** The figure shows a kite in which  $BCD$  is the shape of a quadrant of a circle of radius 42 cm.  $ABCD$  is a square and  $\triangle CEF$  is an isosceles right angled triangle whose equal sides are 6 cm long. Find the area of the shaded region.



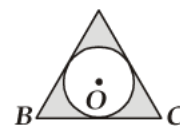
**Q145** Find the area of a shaded region in the figure, where a circular arc of radius 7 cm has been drawn with vertex  $A$  of an equilateral triangle  $ABC$  of side 14 cm as centre. (Use  $\pi = 22/7$  and  $\sqrt{3} = 1.72$ )



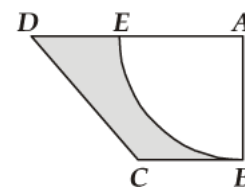
**Q146** A path of width 3.5 m runs around a semi-circular grassy plot whose perimeter is 72 m. Find the area of the path. (Use  $\pi = 22/7$ )

**Q147** A regular hexagon is inscribed in a circle. If the area of hexagon is  $24\sqrt{3}$  cm<sup>2</sup>, find the area of the circle. (Use  $\pi = 22/7$ )

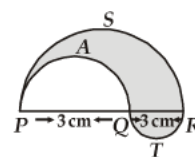
**Q148** A circle is inscribed in an equilateral triangle  $ABC$  of side 12 cm, touching its sides (see figure). Find the radius of the inscribed circle and the area of the shaded part.



**Q149** In figure,  $ABCD$  is a trapezium of area 24.5 cm<sup>2</sup>. In it,  $AD \parallel BC$ ,  $\angle DAB = 90^\circ$ ,  $AD = 10$  cm and  $BC = 4$  cm. If  $ABE$  is a quadrant of a circle, find the area of the shaded region. (Take  $\pi = 22/7$ )



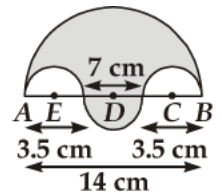
**Q150** In figure,  $PSR$ ,  $RTQ$  and  $PAQ$  are three semi-circles of diameters 10 cm, 3 cm and 7 cm respectively. Find the perimeter of the shaded region.



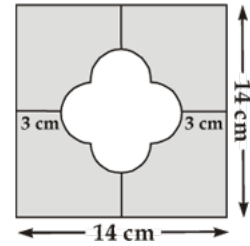
**Q151** Two circular pieces of equal radii and maximum area, touching each other are cut out from a rectangular card board of dimensions 14 cm  $\times$  7 cm. Find the area of the remaining card board. (Use  $\pi = 22/7$ )

**Q152** In figure, the boundary of the shaded region consists of four semi-circular arcs, the smallest two being equal. If the diameter of the largest is 13 cm and of the smallest is 3.5 cm, find

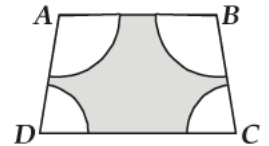
- (i) the length of the boundary. (ii) the area of the shaded region.



**Q153** In figure, find the area of the shaded region. (Use  $\pi = 3.14$ )

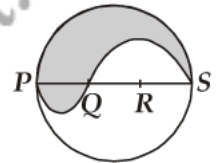


**Q154** In figure,  $ABCD$  is a trapezium with  $AB \parallel DC$ ,  $AB = 18$  cm,  $DC = 32$  cm and the distance between  $AB$  and  $DC$  is 14 cm. Circles of equal radii 7 cm with centres  $A, B, C$  and  $D$  have been drawn. Then, find the area of the shaded region of the figure. (Use  $\pi = 22/7$ )

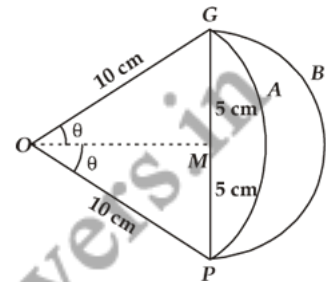


**Q155** An elastic belt is placed round the rim of a pulley of radius 5 cm. One point on the belt is pulled directly away from the centre  $O$  of the pulley until it is at  $P$ , 10 cm from  $O$ . Find the length of the belt that is in contact with the rim of the pulley. Also, find the shaded area.

**Q156**  $PQRS$  is a diameter of a circle of radius 6 cm. The lengths  $PQ, QR$  and  $RS$  are equal. Semi-circles are drawn on  $PQ$  and  $QS$  as diameters as shown in figure. Find the perimeter and area of the shaded region.



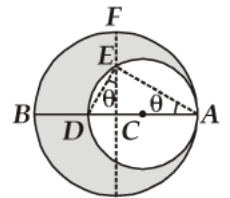
**Q157** The diagram shows two arcs,  $A$  and  $B$ . Arc  $A$  is part of the circle with centre  $O$  and radius  $OP$ . Arc  $B$  is part of the circle with centre  $M$  and radius  $PM$ , where  $M$  is the mid-point of  $PQ$ . Show that the area enclosed by two arcs is equal to  $25 \left( \sqrt{3} - \frac{\pi}{6} \right) \text{cm}^2$ .



**Q158** A chord of a circle of radius 10 cm subtends a right angle at the centre. Find:

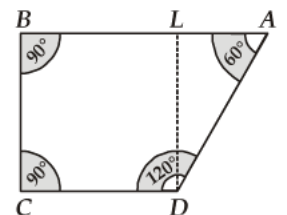
- (i) area of the minor sector (ii) area of the minor segment  
(iii) area of the major sector (iv) area of the major segment (Take  $\pi = 3.14$ )

**Q159** In figure, a crescent is formed by two circles which touch at  $A$ .  $C$  is the centre of the larger circle. The width of the crescent at  $BD$  is 9 cm and at  $EF$  it is 5 cm. Find (i) the radii of two circles (ii) the area of the shaded region.

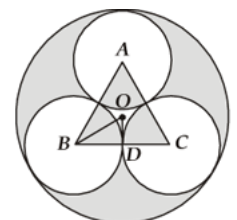


**Q160**  $ABCD$  is a field in the shape of a trapezium.  $AB \parallel DC$  and  $\angle ABC = 90^\circ$ ,  $\angle DAB = 60^\circ$ . Four sectors are formed with centres  $A, B, C$  and  $D$  (see figure). The radius of each sector is 17.5 m. Find the

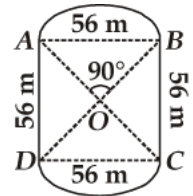
- (i) total area of the four sectors.  
(ii) area of remaining portion given that  $AB = 75$  m and  $CD = 50$  m.



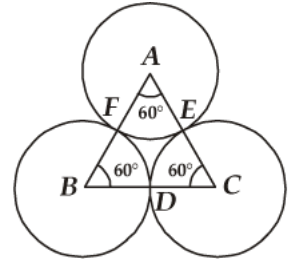
**Q161** In figure, three circles of radius 2 cm touch one another externally. These circles are circumscribed by a circle of radius  $R$  cm. Find the value of  $R$  and the area of the shaded region in terms of  $\pi$  and  $\sqrt{3}$ .



**Q162** In figure, two circular flower beds have been shown on two sides of a square lawn  $ABCD$  of side 56 m. If the centre of each circular flower bed is the point of intersection of the diagonals of the square lawn, find the sum of the areas of the lawns and the flower beds.

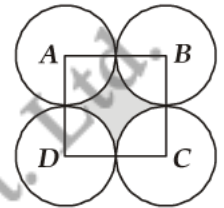


**Q163** The area of an equilateral triangle is  $49\sqrt{3}$  cm<sup>2</sup>. Taking each angular point as centre, a circle is described with radius equal to half the length of the side of the triangle as shown in figure. Find the area of the triangle not included in the circle

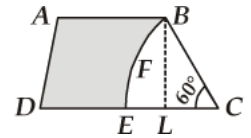


**Q164**  $ABCP$  is a quadrant of a circle of radius 14 cm. With  $AC$  as diameter, a semi-circle is drawn. Find the area of the shaded portion.

**Q165** A child makes a poster on a chart paper drawing a square  $ABCD$  of side 14 cm. She draws four circles with centre  $A, B, C$  and  $D$  in which she suggests different ways to save energy. The circles are drawn in such a way that each circle touches externally two of the three remaining circles (see figure). In the shaded region she write a message 'Save Energy'. Find the perimeter and area of the shaded region. (Use  $\pi = 22/7$ )



**Q166** In figure,  $ABCD$  is a trapezium with  $AB \parallel DC$  and  $\angle BAD = 60^\circ$ . If  $BFEC$  is a sector of a circle with centre  $C$  and  $AB = BC = 7$  cm and  $DE = 4$  cm, then find the area of the shaded region (Use  $\pi = 22/7$  and  $\sqrt{3} = 1.732$ )



**Q167** In the adjoining figure,  $ABC$  is a right angled triangle at  $A$ . Find the area of the shaded region if  $AB = 6$  cm,  $BC = 10$  cm and  $I$  is the centre of incircle of  $\Delta ABC$ .

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- S1.**  $221.76 \text{ cm}^2$ .
- S2.**  $38.5 \text{ cm}^2$ .
- S3.**  $9.625 \text{ cm}^2$ .
- S4.**  $42 \text{ cm}$ .
- S5.**  $61.6 \text{ cm}$ .
- S6.**  $154 \text{ cm}^2$ .
- S7.**  $4\pi : \sqrt{3}$ .
- S8.**  $90^\circ$ .
- S9.**  $8.75 \text{ cm}^2$ .
- S10.**  $30\pi \text{ cm}^2$ .
- S11.**  $77 \text{ cm}^2$ .
- S12.**  $16.8 \text{ cm}$ .
- S13.**  $60^\circ$ .
- S14.**  $25 \text{ cm}$ .
- S15.**  $72^\circ$ .
- S16.**  $90^\circ$ .
- S17.**  $24\pi \text{ cm}^2$ .
- S18.**  $\frac{4\pi}{3} \text{ cm}^2$ .
- S19.**  $\frac{60}{\pi} \text{ cm}$ .
- S20.**  $32 \text{ cm}$ .
- S21.**  $36 \text{ m}$ .
- S22.** (d)  $4$ .
- S23.** (b)  $44$ .
- S24.** (c)  $\frac{50\sqrt{2}}{\pi} \text{ cm}$ .

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- S25.** (b) 21 m.
- S26.** (c)  $77 \text{ cm}^2$ .
- S27.** (c)  $7744 \text{ cm}^2$ .
- S28.** (b) 19%.
- S29.** (d) quadrupled.
- S30.** (c)  $140 \text{ cm}^2$ .
- S31.** (c)  $210 \text{ cm}^2$ .
- S32.** (a)  $r^2$ .
- S33.** (d) 72.7 cm.
- S34.** (c)  $462 \text{ cm}^2$ .
- S35.** (c)  $\sqrt{3} : \pi$ .
- S36.** (b)  $r^2$ .
- S37.** (d)  $\pi : \sqrt{2}$ .
- S38.** (b)  $\pi(2r + h)h$ .
- S39.** (b)  $154 \text{ cm}^2$ .
- S40.** (d)  $25\pi \text{ cm}^2$ .
- S41.** (c) 8 cm.
- S42.** (c) 14 cm.
- S43.** (d)  $126^3$ .
- S44.** (c)  $100^3$ .
- S45.** (c) 8 cm.
- S46.** (a) 96%.
- S47.** (c)  $r^2$  sq. units.
- S48.** (a) 5.
- S49.** (b) 1.1.
- S50.** (b) 26.
- S51.** (d)  $48\sqrt{3}$  units.
- S52.** 3.92 cm.
- S53.** 154 cm, 126 cm.

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**S54.**  $157 \text{ cm}^2$ ,  $78.5 \text{ cm}^2$ .

**S55.** 4 : 9.

**S56.**  $154 \text{ m}^2$ .

**S57.**  $154 \text{ cm}^2$ .

**S58.** 24.64 cm.

**S59.** 250 revolutions.

**S60.** 15.84 km/hr.

**S61.** 300 revolutions.

**S62.** 70 cm.

**S63.** Rs. 528.

**S64.** 7 metres.

**S65.** 44 cm.

**S66.**  $616 \text{ cm}^2$ .

**S67.**  $577.5 \text{ cm}^2$ .

**S68.**  $\pi : 2$ .

**S69.** 4 : 9.

**S70.**  $\pi : 2$ .

**S71.** 14 cm.

**S72.** 72.7 cm

**S73.**  $9.625 \text{ cm}^2$ .

**S74.**  $10.26 \text{ cm}^2$ .

**S75.**  $15.6 \text{ cm}^2$ .

**S76.**  $183.3 \text{ cm}^2$ .

**S77.**  $\frac{4\pi}{3} \text{ cm}^2$ .

**S78.** Radius of the circle = 8 cm.

**S79.**  $4.153 \text{ cm}^2$ ,  $46.05 \text{ cm}^2$ .

**S80.** 1910.85 cm.

**S81.**  $130.95 \text{ cm}^2$ .

**S82.**  $5.5 \text{ cm}^2$ .

**S83.** 44 cm, 462 cm<sup>2</sup>.

**S84.** 44.8 m<sup>2</sup>.

**S85.** 45.03 m<sup>2</sup>.

**S86.** 44 cm, 770 cm<sup>2</sup>.

**S87.** 203 cm<sup>2</sup>.

**S88.** 346.5 cm<sup>2</sup>.

**S89.** 1253.5 cm<sup>2</sup>.

**S90.** 30°.

**S91.**  $\left(\frac{8\pi}{3} - 4\sqrt{3}\right)$  cm<sup>2</sup>.

**S92.** 9384 m<sup>2</sup>.

**S93.** Rs. 2002.

**S94.** 30.50 cm<sup>2</sup>.

**S95.** 462 cm<sup>2</sup>.

**S96.** 122.57 cm<sup>2</sup>.

**S97.** (i) 126 cm<sup>2</sup>. (ii) 84 cm.

**S98.** 21387 m<sup>2</sup>.

**S99.** (i) 9.625 cm<sup>2</sup>. (ii) 6.482 cm<sup>2</sup>.

**S100.** 2618 m<sup>2</sup>.

**S101.** 2331 cm<sup>2</sup>.

**S102.**  $r^2$ .

**S103.** 334.3125 cm<sup>2</sup>.

**S104.** 228 cm<sup>2</sup>.

**S105.** Rs. 1925.

**S106.** 11 cm and 3 cm.

**S107.** 10 cm and 4 cm.

**S108.** 32.40 m.

**S109.** 560.

**S110.** 40.

**S111.** (i) 352 m<sup>2</sup>, (ii) Rs. 528, (iii) Rs. 478.

**S112.**(i) 34.88 cm, (ii) 50.64 cm.

**S113.**  $\frac{25\pi}{3}$  cm<sup>2</sup>.

**S114.**  $\frac{21}{4}(88 - 21\sqrt{3})$  cm<sup>2</sup>.

**S115.** 28.5 cm<sup>2</sup>.

**S116.** 686.295 cm<sup>2</sup>.

**S117.** Proved.

**S118.** Proved.

**S119.** 17.80 cm<sup>2</sup>.

**S120.** 14.25 cm<sup>2</sup>, 142.75 cm<sup>2</sup>.

**S121.** 56 cm<sup>2</sup>, 560 cm<sup>2</sup>.

**S122.** 261.5 m<sup>2</sup>.

**S123.** Rs. 3388.

**S124.**  $\frac{4}{3}(4\pi - 3\sqrt{3})$  cm<sup>2</sup>.

**S125.** The area of the shaded region is 7056 m<sup>2</sup>.

**S126.** 249.4 cm<sup>2</sup>.

**S127.** 22.126 cm<sup>2</sup>.

**S128.** 16.05 cm<sup>2</sup>.

**S129.** 115.5 cm<sup>2</sup>.

**S130.** Rs. 5887.50.

**S131.** Rs. 3140.

**S132.**  $\frac{6}{7}a^2$ .

**S133.** 535.71 m<sup>2</sup>.

**S134.** 6.125 cm<sup>2</sup>.

**S135.** 115.5 cm<sup>2</sup>, 9.26 cm.

**S136.** 428.75 cm<sup>2</sup>.

**S137.**(i) 12.375 cm<sup>2</sup>, (ii) Rs. 3.

**S138.** Rs. 3061.50.

**S139.** 5.48 cm<sup>2</sup>.



**S140.**(i) 22 cm. (ii) 231 cm<sup>2</sup>.

**S141.**294 cm<sup>2</sup>.

**S142.**45π cm<sup>2</sup>.

**S143.**(i) 1 : √2, (ii) 1 : 2.

**S144.**1404 cm<sup>2</sup>.

**S145.**187.44 cm<sup>2</sup>.

**S146.**173.25 cm<sup>2</sup>.

**S147.**50.24 cm<sup>2</sup>.

**S148.**2√3 cm, 24.638 cm<sup>2</sup>.

**S149.**14.875 cm<sup>2</sup>.

**S150.**31.4 cm.

**S151.**21 cm<sup>2</sup>.

**S152.**(i) 44 cm. (ii) 86.625 cm<sup>2</sup>.

**S153.**154.88 cm<sup>2</sup>.

**S154.**196 cm<sup>2</sup>.

**S155.** $\frac{25}{3}(3\sqrt{3} - \pi)$  cm<sup>2</sup>.

**S156.**Required perimeter = 12π cm, Required Area = 37.71 cm<sup>2</sup>.

**S157.**Proved.

**S158.**(i) 78.5 cm<sup>2</sup>. (ii) 28.5 cm<sup>2</sup>. (iii) 235.5 cm<sup>2</sup>. (iv) 285.5 cm<sup>2</sup>.

**S159.**642.915 cm<sup>2</sup>.

**S160.**962.5 m<sup>2</sup>.

**S161.** $\left\{ \frac{4\pi}{3}(4\sqrt{3} + 1) - 4\sqrt{3} \right\}$  cm<sup>2</sup>.

**S162.**4032 m<sup>2</sup>.

**S163.**7.77 cm<sup>2</sup>.

**S164.**98 cm<sup>2</sup>.

**S165.**Area = 42 cm<sup>2</sup>, Perimeter = 44 cm.

**S166.**28.89 cm<sup>2</sup>.

**S167.** $\frac{80}{7}$  cm<sup>2</sup>.