RS Aggarwal Solutions for Class 10 Maths Chapter 18 Exercise 18.2: RS Aggarwal Solutions for Class 10 Maths Chapter 18 Exercise 18.2 provide detailed and clear answers to the exercises on the areas of circles, sectors, and segments. This chapter focuses on applying formulas to solve problems involving the areas of these geometric figures.

These solutions are designed to enhance comprehension and problem-solving skills. You can refer to these solutions to practice and master the concepts effectively.

RS Aggarwal Solutions for Class 10 Maths Chapter 18 Exercise 18.2 Overview

RS Aggarwal Solutions for Class 10 Maths Chapter 18 Exercise 18.2, prepared by subject experts from Physics Wallah.

By using these comprehensive solutions, students can enhance their grasp of the topic and effectively prepare for their exams.

RS Aggarwal Solutions for Class 10 Maths Chapter 18 Exercise 18.2 PDF

RS Aggarwal Solutions for Class 10 Maths Chapter 18 Exercise 18.2 are available in a PDF format. This PDF provides detailed solutions to all the questions in Exercise 18.2, focusing on the areas of circles, sectors, and segments. It is a valuable resource for students aiming to enhance their understanding and practice of these concepts.

You can download the PDF using the link provided below to access these comprehensive solutions and boost your preparation.

RS Aggarwal Solutions for Class 10 Maths Chapter 18 Exercise 18.2 PDF

RS Aggarwal Solutions for Class 10 Maths Chapter 18 Exercise 18.2

Below we have provided RS Aggarwal Solutions for Class 10 Maths Chapter 18 Exercise 18.2 for the ease of the students –

Q. What is the perimeter of a square which circumscribes a circle of radius a cm?

Solution:

When a square circumscribes a circle, the radius of the circle is half the length of the square. Therefore if the radius of the circumscribed circle is a, the diameter will be 2a. It is this diameter that is equal to the length of the square.
Therefore the length of the square is 2a cm.

The area of a square is 4 × length
= 4 × 2a cm
= 8a cm

Q. Find the length of the arc of a circle of diameter 42 cm which subtends an angle of 60◦ at the centre.

Solution:

D=42cm
r=12d
r = 12 × 42
r=21cm
θ=60°
l= θ360°×2πr
l= 60°360°×2×227 ×21
l=16×2×22×3
l=1326
l=22cm
the length of an arc is 22cm

Q. Find the perimeter of a semicircular protractor whose diameter is 14 cm.

Solution:

Radius =142 =7cm
Perimeter of semicircle = πr + d
=227×7 + 14 cm
= 22+7 cm
=29 cm

Q. Find the radius of a circle whose perimeter and area are numerically equal.

Solution:

The perimeter of a circle is 2πr where r is the radius of the circle and it's area is πr^2

As per question;

area of the circle = perimeter of the circle
$2\pi r = \pi r^2$
2 = πr2πr = r

Therefore, if r is 2units then the area and perimeter of the circle would be numerically equal.

Q. Find the area of the sector of a circle having radius 6 cm and of angle 30◦. [Take π= 3.14]

Solution:

Area of the sector = πr2 × θ360o
=3.14× 6× 6× 30o360o
=18.84 cm

Q. A square is inscribed in a circle. Find the ratio of the areas of the circle and the square.

Solution:

First, inscribed meaning inside of something.

first radius of the circle is r
then diagonal of the circle is equal to the diagonal of the square, means 2r

now length(l) of one side of the square is,
l\sqrt{2} = 2r \ l = 2r \div \sqrt{2} \ l = r2 \sqrt{2} \div 2
now area of the square should be,
{(r2 \sqrt{2} \div 2)}^{2} \ {r}^{2} 8 \div 4 \ {r}^{2} 2
now you know the area of a circle which is
\pi {r}^{2}
now ratio of them is,
$r^2 2 : \pi r^2$
2:π is the answer.

Q. The minute hand of a clock is 15 cm long. Calculate the area swept by it in 20 minutes. [Take π = 3.14.]

Solution:

in 1 hr the clock will complete 1rotation here
radius of circle - 15cm
circumference of circle - 2πr
2×22/7×15 cm

30 × 22/7
- 94.2cm
in 20 min
=94.2*20/60
=31.4

Q. The area of the sector of a circle of radius 10.5 cm is 69.3cm^2. Find the central angle of the sector.

Solution:

Area of sector = theta / 360 * pie * r * r

theta / 360 * (22 / 7) * (21 / 2) * (21 / 2) = 69.3

theta = 72

Ans: 72 degree

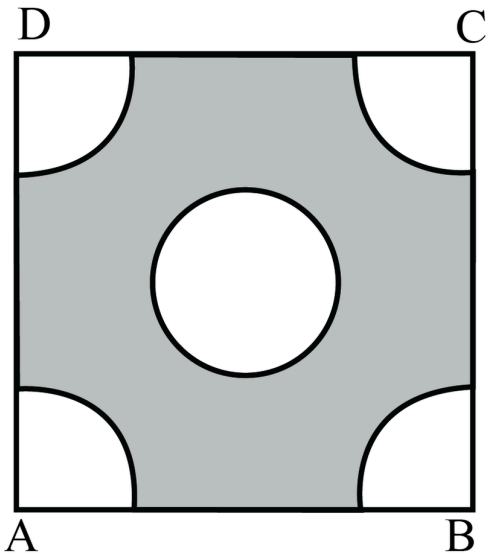
Q. The perimeter of a circle is 17.5 cm. Find the area of the sector enclosed by two radii and an arc 44 cm in length.

Solution:

Here arc length; Cs =44 cm
Radius of a circle; r = 17.5 cm
So, area of sector = Cs/2πr×πr2

=44/2π×17.5×π×(17.5)(17.5)
=22×17.5
=385 cm sq.

Q.



In the given figure, ABCD is a square of side 4 cm. A quadrant of a circle of radius 1 cm is drawn at each vertex of the square and a circle of diameter 2 cm is also drawn. Find the area of the shaded region [Use π = 3.14.]

Solution:

area of square = 4 * 4
= 16 cm^2

Area of 4 qudrant = 4 * 1/4 * 22/7

= 22/7 cm^2

Area of circle = 22/7 * 1 * 1

= 22/7 cm^2

Area of shaded portion = 16 - {22/7 + 22/7}

= 16 - {44/7}

=112 - 44
7

=68/ 7
= 9.71 cm ^2

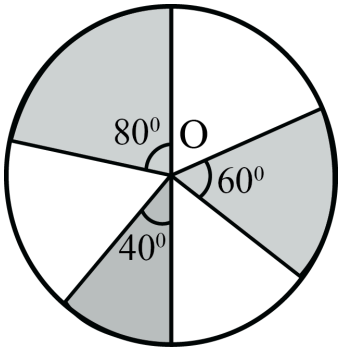
Q. From a rectangular sheet of paper ABCD with AB = 40 cm and AD = 28 cm, a semicircular portion with BC as diameter is cut off.Find the area of the remaining paper.

Solution:

First find the ar of the rectangle ABCD
=28*40
=1120
then fimd the ar of semicircle=12ofcircle
=quadrant OAPC =πr24=14×227×7×7=308cm2

then subtract=arof ABCD-ar of semi cirlcle
=1120-308
=812cm2
this is the remaining area of paper

Q.



In the given figure, three sectors of a circle of radius 7 cm, making angles of 60◦, 80◦and 40◦ at the centre are shaded. Find the area of the shaded region.

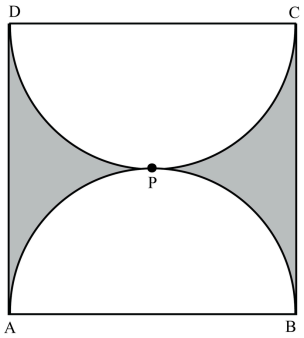
Solution:

Area of the shaded region = Area of the sector having central angle 60o + Area of sector having central angle 80o + Area of the sector having central angle 40o

=[60o360o×π(7)2]+[80o360o×π(7)2]+[40o360o×π(7)2]=π(7)2(60o360o+80o360o+40o360o)=π(7)2(180o360o)=227×(7)2(12)=77cm2

Hence, the area of the shaded region is 77cm

Q.



Find the perimeter of the shaded region in the figure, if ABCD is a square of side 14 cm and APB and CPD are semicircles.

Solution:

Given:

Side of a square(AB=BC=AD=CD) = 14 cm

Diameter of circle= side of square= 14 cm

Radius of circle= = 7cm

Perimeter of the shaded region = side of AD + side of BC+ length of Semicircle APB + length of Semicircle CPD

Perimeter of the shaded region = 14+14+ +πr+πr

=28+ 2πr

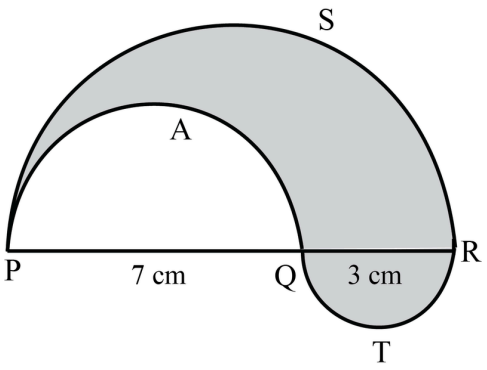
= 28 + 2( )× 7

= 28 + 44

= 72 cm

Hence, the Perimeter of the shaded region = 72 cm.

Q.



In the given figure, PSR, RTQ and PAQ are three semicircles of diameter 10 cm, 3 cm and 7 cm respectively. Find the perimeter of shaded region.

Solution:

Radius of semicircle PSR = 10cm/2 = 5cm

RadiusofsemicirclePAQ=72=3.5cm
RadiusofsemicircleRTQ=32=1.5cm

Perimeter of shaded region = perimeter of semicircle PSR + perimeter of semicircle RTQ + perimeter of semicircle PAQ

And we know that perimeter of a semicircle=π×r

Required perimeter=π×5+π×1.5cm+π×3.5 cm

= 3.14 (5cm + 1.5cm +3.5 cm) = 3.14 x 10cm = 31.4 cm

Q. Find the area of a quadrant of a circle whose circumference is 44 cm.

Solution:

To find the quadrant of a circle we will have to first determine the circumference of the circle which is 2πr.

Here, the circumference being 44cm,

2πr=44 Dividing by 2 both lhs and rhs we have

\(\pi r=22

∴r=22π
= 7

Now, Area of circle = πr2=227×r2

→Areaofcircle=227×7×7

The area of the quadrant of a circle whose circumference in 44cmis=154.06cm

Q. A square ABCD is inscribed in a circle of radius r. Find the area of the square.

Solution:

Since, equal sides of the square can be considered as equal chords, which subtend 90° angle at the centre.

Hence, diagonals of the square passes through the centre.

Area of square = a²

→Inarighttriangle,hypotenuseisthediagonal

→(2r)2=a2+a2

→4r2=2a2

→a2=2×r2

→areaofsquare=2×r2 …….(1)

& area of circle = πr2……(2)

Q. The cost of fencing a circular field at the rate of Rs 25 permetre is Rs 5500. The field is to be ploughed at the rate of 50 paise per m^2. Find the cost of ploughin the field. [Take π = \frac{22}{7}]

Solution:

let r be the radius of circle

Circumference = 220

⇒2Πr = 220

⇒ r = 35 cm

Now

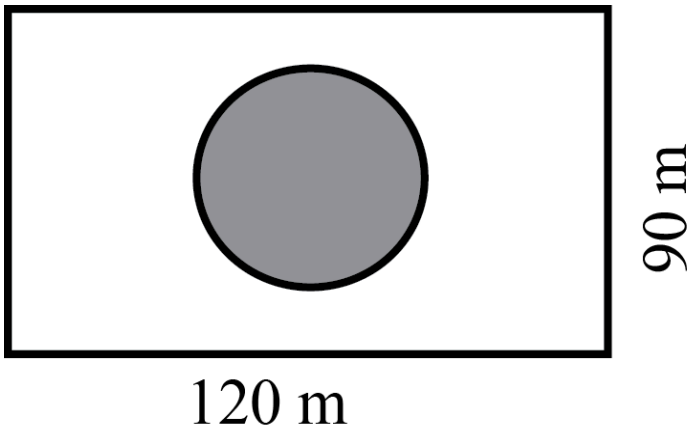
Now,

Area of field=

Cost of plugging = Rate x Area of field = 0.5 x 3850 = Rs 1925

Hence, the cost of plugging the field is Rs 1925.

Q.



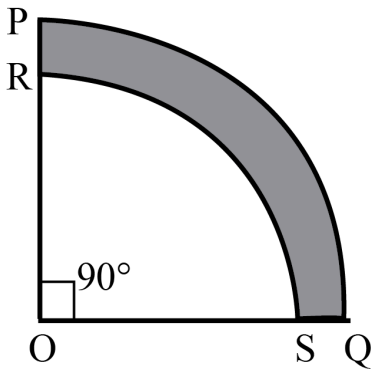
A park is in the form of a rectangle 120 m by 90 m. At the centre of the park, there is a circular lawn as shown in the figure. The area of the park excluding the lawn is 2950 m^2. Find the radius of the circular lawn. [Given, π = 3.14]

Solution:

Area of rec. park=(120×90)m²=10800m²
Area of rec. park excluding lawn=2950m²
Area of circular lawn=(10800 - 2950)m²
=7850m²
Let the radius be = r
7850/3.14 = 3.14r²/3.14
→2500 = r²
→√2500 = √r²
→50 = r
→r = 50

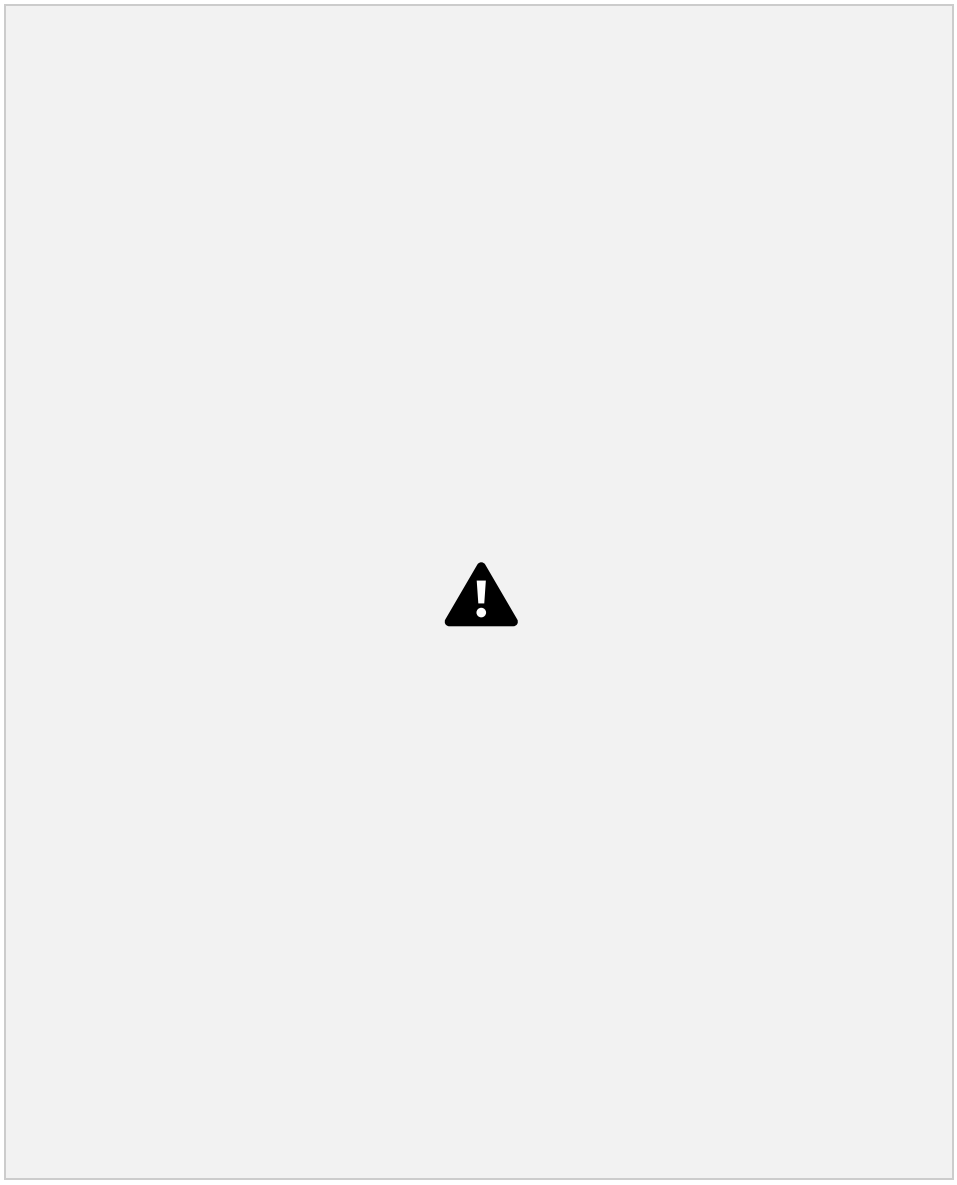
Radius = 50m

Q.



In the given figure, PQSR represents a flower bed. If OP = 21 m and OR = 14m, find the area of the flower bed.

Solution:



Q. A horse is tethered to one corner of a field which is in the shape of an equilateral triangle of side 12 m. If the length of the rope is 7 m, find the area of the field which the horse cannot graze. Take √3 = 1.732. Write the answer correct to 2 places of decimal.

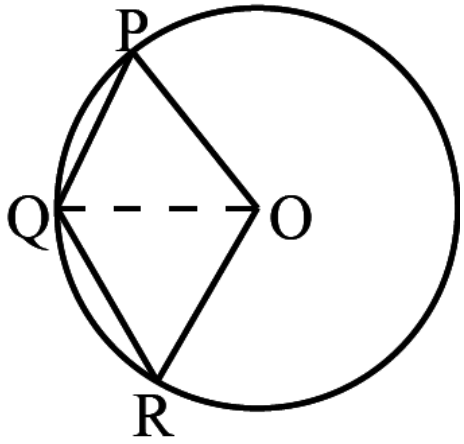
Solution:

Area(ABC)=√34a2=√34×12×12=36√3 m
Horse can graze only in sector BDE.

area(BDE)=θ360×πr2=60360×227×7×7=16×22×7=13×11×7=773 m

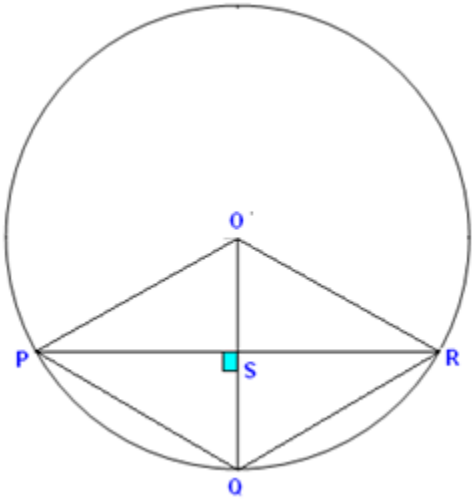
Area remains ungrazed =36√3−773=62.35−25.67=36.68 m

Q.



In the given figure, OPQR is a rhombus, three of whose vertices lie on a circle with centre O. If the area of the rhombus is 32 √3cm2, find the radius of the circle.

Solution:



From the figure, O is the centre of the circle and OPQR is a rhombus.
Let the diagonals OQ and PR intersect at S

Given area of rhombus OPQR =32√3 cm

Let OP=OQ=OR=r cmOS=SQ=(r2) cm and RS=PS

In right ΔOSP,OP2=OS2+PS2(By Pythagoras theorem)⇒r2=(r2)2+PS2⇒PS2=r2–(r2)2=3r24∴PS=√3r2⇒PR=2PS=√3r

Area of rhombus OPQR =12×d1×d2=12×OQ×PR⇒32√3=12×r×√3r⇒32=12×r2r2=64r=8 cm

Radius of circle = 8 cm

Q. The radius of the wheel of a vehicle is 42 cm. How many revolutions will it complete in a 19.8-km-long journey?

Solution:

Distance covered in one revolution= 2πR=2×227×42=264 cm

total distance= 19.8km= 1980000 cm

No. of revolutions=total distance distance covered in 1 revolution

1980000264=7500 revolutions

Q. The wheel of a motorcycle is of radius 35 cm. How many revolutions per minute must the wheel make so as to keep a speed of 66 km/hr ?

Solution:

Circumference = 2πr

= 2x(22/7)x35

= 220 cm = 2.2 m
(converted from cm to m)
Speed = 66 km/hr

= 66 x(5/18) m/s
(converted from km/hr to m/s)

Distance travelled in 1 min= 66 x (5/18) x 60 m/min= 1100 m

Now, number of revolutions = distance in one min /circumference of the wheel.

N= 1100/2.2 = 500 revolutions per minute.

Benefits of RS Aggarwal Solutions for Class 10 Maths Chapter 18 Exercise 18.2

- **Detailed Explanations**: The solutions provide clear step-by-step explanations for each problem, helping students understand the methodology and concepts behind the calculations.
- **Concept Clarity**: By breaking down complex problems into manageable steps, these solutions help reinforce understanding of the areas of circles, sectors, and segments, ensuring that students grasp the core concepts.
- **Enhanced Problem-Solving Skills**: Regular practice with these solutions helps improve problem-solving skills, enabling students to tackle similar questions with confidence in their exams.
- **Exam Preparation**: The solutions align with the ICSE syllabus providing students with targeted practice to effectively prepare for their board exams.
- **Self-Assessment**: Students can use these solutions to check their answers and understand any mistakes, allowing for effective self-assessment and learning.