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PRACTICE PAPER 02 (2023-24)

CHAPTER 10 PERIMETER AND AREA (ANSWERS)

SUBJECT: MATHEMATICS **MAX. MARKS : 40**

CLASS : VII **DURATION : 1½ hr**

SECTION – A

Questions 1 to 6 carry 1 mark each.

1. A rectangular wire of length 40 cm and breadth 20 cm is bent in the shape of a square. The side of the square is

(a) 10 cm (b) 20 cm (c) 30 cm (d) 40 cm

Ans: (c) 30 cm

Side of square = $2 (40 + 20)/4 = 30$ cm

2. The diameter of a circle is 14 cm. Find its circumference

(a) 14 cm (b) 24 cm (c) 44 cm (d) 66 cm

Ans: (c) 44 cm

Circumference = $2\times 22/7 \times 7 = 44$ cm

3. When the circumference and area of a circle are numerically equal, what is the diameter numerically equal to?

(a) Area (b) Circumference (c) 271 (d) 4

Ans: (d) 4

Circumference of circle = Area of circle

$\Rightarrow 2\pi r = \pi r^2$

$\Rightarrow 2r = r^2 \Rightarrow 2 = r \Rightarrow$ diameter $= 2r = 4$

4. The area of a circle is 2464m2 , then the diameter is

(a) 56 m (b) 154 m (c) 176 m (d) none of these

Ans: (a) 56 m

By given, Area = $2464m^2$

$\Rightarrow \pi r^2 = 2464$

$\Rightarrow \frac{22}{7} r^2 = 2464 \Rightarrow r^2 = \frac{2464\times 7}{22} = 784$

$\Rightarrow$ r =28 m $\Rightarrow$ diameter = 2r = 58 m

5. A wire is bent to form a square of side 22 cm. If the wire is rebent to form a circle, its radius is

(a) 22 cm (b) 14 cm (c) 11 cm (d) 7 cm

Ans: (b) 14 cm

From the question it is given that, side of square is 22 cm.

And also, perimeter of a square and circumference of circle are equal, because the length of the wire is same.

Perimeter of square = circumference of circle

$\Rightarrow 4 \times$ side $= 2 \times \pi \times r \Rightarrow 4 \times 22 = 2 \times (22/7) \times r$

$\Rightarrow r = (4 \times 22 \times 7)/(2 \times 22) \Rightarrow r = 14$ cm

Therefore, radius of circle is 14 cm.

6. Area of a rectangle and the area of a circle are equal. If the dimensions of the rectangle are 14cm × 11 cm, then radius of the circle is

(a) 21 cm (b) 10.5 cm (c) 14 cm (d) 7 cm.

Ans: (d) 7 cm

From the question it is given that, dimensions of rectangle length = 14 cm, breadth = 11 cm

As area of rectangle = area of circle

$\Rightarrow$ length $\times$ breadth = πr^2

$\Rightarrow 14 \times 11 = (22/7) \times r^2$

$\Rightarrow r^2 = (14 \times 11 \times 7)/22 \Rightarrow r^2 = 49$

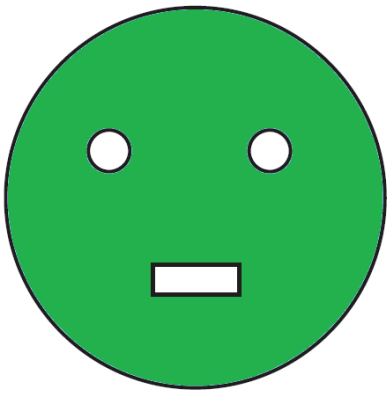
$\Rightarrow r = \sqrt{49} \Rightarrow r = 7$ cm

SECTION – B(CCT Questions)

Questions 7 to 10 carry 1 mark each.

CCT Question

Anita is making face mask using green coloured card sheet for her Art project. From a circular card sheet of radius 14 cm, she removed two circles of radius 3.5 cm and a rectangle of length 3 cm and breadth 1cm. (as shown in the below figure).



Answer the following questions based on the above information:

7. Find the area of small two circles.

(a) 616 cm^2 (b) 3 cm^2 (c) 77 cm^2 (d) 536 cm^2

Ans: (c) 77 cm^2

Area of the 2 small circles = $2 \times \pi r^2$

$= 2 \times (22/7 \times 3.5^2) = 2 \times (22/7 \times 3.5 \times 3.5) = 2 \times ((22/7) \times 12.25) = 2 \times 38.5 = 77$ cm^2

8. Find the area of big circle.

(a) 616 cm^2 (b) 3 cm^2 (c) 77 cm^2 (d) 536 cm^2

Ans: (a) 616 cm^2

Area of the big circle = πr^2

$= 22/7 \times 14^2 = 22/7 \times 14 \times 14 = 22 \times 2 \times 14 = 616$ cm^2

9. Find the area of the remaining sheet.

(a) 616 cm^2 (b) 80 cm^2 (c) 77 cm^2 (d) 536 cm^2

Ans: (d) 536 cm^2

Area of the rectangle = Length $\times$ Breadth = $3 \times 1 = 3$ cm^2

Area of the remaining part = Card sheet area – (Area of two small circles + Rectangle area)

$= 616 – (77 + 3) = 616 – 80 = 536$ cm^2

10. Find the area of the sheet removed.

(a) 616 cm^2 (b) 80 cm^2 (c) 77 cm^2 (d) 536 cm^2

Ans: (b) 80 cm^2

Area of the sheet removed = Area of two small circles + Rectangle area = $77 + 3 = 80$ cm^2

SECTION – C

Questions 11 to 13 carry 2 marks each.

11. The base of a parallelogram is twice its height. If the area of the parallelogram is 512 cm^2, find the base and height.

Ans: Let the height of the parallelogram be x cm.

Then the base of the parallelogram is 2x cm. [from given data]

Given that the area of the parallelogram = 512 cm^2

We know that area of a parallelogram = Base x Height

$\Rightarrow 512 = (2x)(x) \Rightarrow 512 = 2x^2$

$\Rightarrow x^2 = 512/2 = 256\ cm^2$

$\Rightarrow x^2 = (16)^2 \Rightarrow x = 16$ cm

Hence height of parallelogram = x = 16cm

And base of the parallelogram = 2x = 2 x 16 = 32 cm

12. The ratio of the radii of two circles is 3: 2. What is the ratio of their circumferences?

Ans: Given that the ratio of the radii = 3: 2

So, let the radii of the two circles be 3r and 2r respectively.

And let C_1 and C_2 be the circumference of the two circles of radii 3r and 2r respectively.

$C_1 = 2\pi \times 3r = 6\pi r$ … (i)

Now $C_2 = 2 \times 2\pi r = 4\pi r$ … (ii)

Consider, $C_1/C_2 = (6\pi r)/ 4\pi r = 6/4 = 3/2$

$C_1: C_2 = 3: 2$

13. If the area of a circle is 50.24 m^2, find its circumference.

Ans: Given area of a circle is 50.24 m^2

We know that area of circle = πr^2

$\Rightarrow 50.24 = (22/7) \times r^2 \Rightarrow r^2 = (50.24 \times 7)/22 \Rightarrow r^2 = 15.985 \Rightarrow r = 3.998$ m

We know that circumference of circle = $2\pi r$

$\Rightarrow C = 2 \times (22/7) \times 3.998 \Rightarrow C = 25.12$ m

SECTION – D

Questions 14 to 17 carry 3 marks each.

14. The diameter of a wheel of a car is 63 cm. Find the distance travelled by the car during the period, the wheel makes 1000 revolutions.

Ans: It may be noted that in one revolution, the cycle covers a distance equal to the circumference of the wheel.

Given the diameter of the wheel = 63 cm

We know that circumference of the wheel = πd = 22/7 x 63 = 198 cm.

Thus, the cycle covers 198 cm in one revolution.

Therefore, the distance covered by the cycle in 1000 revolutions = (198 x 1000)

= 198000 cm = 1980 m.

15. The radius of a circle is 14 cm. Find the radius of the circle whose area is double of the area of the circle.

Ans: Let the area of the circle whose radius is 14 cm be A_1.

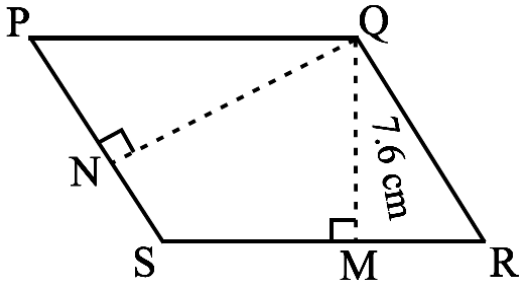
We know that area of the circle = πr^2

$\therefore A_1 = \pi (14)^2$

Let A_2 and r_2 be the area and radius of the second circle respectively whose area is double the area of circle A_1.

$A_2 = 2\ A_1 \Rightarrow \pi\ (r_2)^2 = 2 \times \pi\ (14)^2 \Rightarrow (r_2)^2 = 2 \times (14)^2 \Rightarrow r_2 = 14\sqrt{2}$ cm
Hence the radius of the circle A_2 is $14\sqrt{2}$ cm.

16. PQRS is a parallelogram (see below figure). QM is the height from Q to SR and QN is the height from Q to PS. If SR = 12 cm and QM = 7.6 cm. Find:



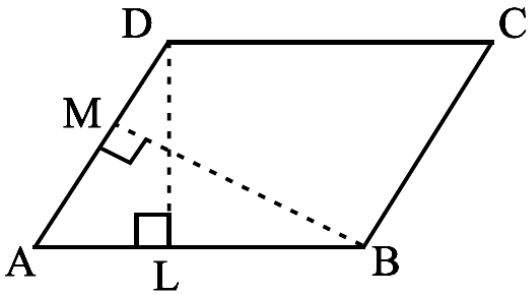
(a) the area of the parallelogram PQRS
(b) QN, if PS = 8 cm
Ans: From the question, it is given that
SR = 12 cm, QM = 7.6 cm
(a) We know that, Area of the parallelogram = Base × Height
= SR × QM = 12 × 7.6 = 91.2 cm^2
(b) Area of the parallelogram = Base × Height
⇒ 91.2 = PS × QN ⇒ 91.2 = 8 × QN ⇒ QN = 91.2/8
⇒ QN = 11.4 cm

17. The area of a rhombus is 28 m^2. If its perimeter be 28 m, find its altitude.
Ans: Given perimeter of a rhombus = 28 m
But we know that perimeter of a rhombus = 4 (Side)
⇒ 4(Side) = 28 m ⇒ Side = 28/4 ⇒ Side = 7m
Now, Area of the rhombus = 28 m^2
But we know that area of rhombus = Side x Altitude
⇒ (Side x Altitude) = 28 m^2
⇒ (7 x Altitude) = 28 m^2
⇒ Altitude = 28/7 = 4 m

SECTION – E

Questions 18 to 20 carry 4 marks each.

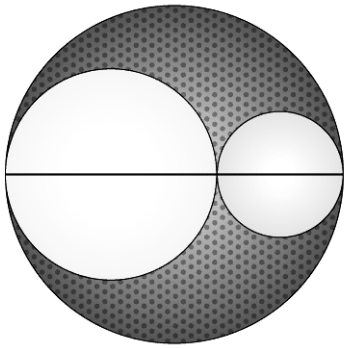
18. DL and BM are the heights on sides AB and AD, respectively, of parallelogram ABCD (see below figure). If the area of the parallelogram is 1470 cm2, AB = 35 cm and AD = 49 cm, find the length of BM and DL.



Ans: From the question, it is given that
Area of the parallelogram = 1470 cm^2
Given, AB = 35 cm and AD = 49 cm
We know that, Area of the parallelogram = Base × Height
⇒ 1470 = AB × BM ⇒ 1470 = 35 × DL ⇒ DL = 1470/35

$\Rightarrow$ DL = 42 cm
Area of the parallelogram = Base × Height
$\Rightarrow$ 1470 = AD × BM $\Rightarrow$ 1470 = 49 × BM
$\Rightarrow$ BM = 1470/49 $\Rightarrow$ BM = 30 cm

19. Two circles are drawn inside a big circle with diameters 2/3rd and 1/3rd of the diameter of the big circle as shown in below figure. Find the area of the shaded portion, if the length of the diameter of the circle is 18 cm.



Ans: It is given that, diameter of the big circle = 18 cm
Radius of the big circle = 9 cm
Area of the big circle, $A = \pi r^2 = \pi (9)^2 = 81\pi$ cm^2
Let $d_1 = (2/3) \times 18 = 12$ cm
$\Rightarrow r_1 = 6$ cm
Area of the circle, $A_1 = \pi r^2 = \pi (6)^2 = 36\pi$ cm^2
$\Rightarrow d_2 = (1/3) \times 18 = 6$ cm
$\Rightarrow r_2 = 3$ cm
Area of the circle, $A_2 = \pi r^2 = \pi (3)^2 = 9\pi$ cm^2
Area of the shaded portion = $A - (A_1 + A_2)$
Area of the shaded portion = $81\pi - (36\pi + 9\pi) = 36\pi$ cm^2

20. Shazli took a wire of length 44 cm and bent it into the shape of a circle. Find the radius of that circle. Also, find its area. If the same wire is bent into the shape of a square, what will be the length of each of its sides? Which figure encloses more area, the circle or the square? (Take $\pi = 22/7$)
Ans: From the question, it is given that
Length of wire that Shazli took =44 cm
Then, If the wire is bent into a circle, We know that the circumference of the circle = $2\pi r$
$\Rightarrow 44 = 2 \times (22/7) \times r$
$\Rightarrow 44 = 44/7 \times r$
$\Rightarrow (44 \times 7)/44 = r \Rightarrow r = 7$ cm
Area of the circle = πr^2
$= 22/7 \times 7^2 = 22/7 \times 7 \times 7$
$= 22 \times 7 = 154$ cm^2
Now, If the wire is bent into a square,
The length of each side of the square = 44/4 = 11 cm
Area of the square = Length of the side of square$^2 = 11^2 = 121$ cm^2
By comparing the two areas of the square and circle,
Clearly, the circle encloses more area.