ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

CLASS 8

SUBJECT : Arithmetic **Work sheet 17 answer key**

Marks:15 **Circles(Area)**

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Answer all the following questions(1×15=15)

1. The area of the circle is 154 cm^2. The radius of the circle is
   (a) 7 cm
   (b) 14 cm
   (c) 3.5 cm
   d) 17.5 cm
   Answer: d Explaination: Reason: Area of circle = 154 cm^2
   $\Rightarrow nr^2 = 154\ cm^2$
   $\Rightarrow 22/7 \times r^2 = 154$
   $\Rightarrow r^2 = 154 \times 22/7$
   $\Rightarrow r^2 = 7 \times 7 = 49$
   $\therefore r = \sqrt{49} = 7$
2. The area of a quadrant of a circle whose circumference is 22 cm, is
   $(a)\ \frac{11}{8}\ cm^2 \quad (b)\ \frac{77}{2}\ cm^2 \quad (c)\ \frac{77}{4}\ cm^2 \quad (d)\ \frac{77}{8}\ cm^2$
   Answer: d
   Explaination: Reason: Here $2\pi r = 22$ cm
   $2 \times 22/7 \times r = 22$
   $\Rightarrow r = 22 \times 7/22 \times 12 = 72$ cm
   $\therefore$ Area of quadrant of circle = $14\pi r^2 = 14 \times 22/7 \times 72 \times 72 = 77/8\ cm^2$

3. Area of circular ring is
   (a) $\pi(R^2 - r^2)$
   (b) πRr
   (c)$\pi(R+r)$
   (d) $\pi(R-r)$
   Answer: a

4. The area of the circle whose diameter is 21 cm is
   (a) 346.5 cm^2

(b) 37.68 cm²
(c) 18.84 cm²
(d) 19.84 cm²

Answer: a

Explaination: Reason: Here diameter = 21 cm

∴ Radius r = $21/2$ cm

Area of the circle, A = πr²

∴ $A=22/7\times21/2\times21/2=11\times3\times21/2=693/2=346.5cm^2$

5. The area of a circle whose circumference is 22 cm, is

(a) 11 cm²
(b) 38.5 cm²
(c) 22 cm²
(d) 77 cm²

Answer: b

Explaination:

(b); ***Reason:*** Circumference of circle = 22 cm, $2\pi r = 22$ cm

$$\Rightarrow \quad 2\left(\frac{22}{7}\right)r = 22 \qquad \Rightarrow r = \frac{22\times7}{2\times22} = \frac{7}{2}\text{ cm}$$

$$\therefore \quad \text{Area of circle} = \pi r^2 = \frac{22}{7}\times\frac{7}{2}\times\frac{7}{2} = \frac{77}{2} = 38.5\text{ cm}$$

6. The area of a circle is 154 cm^2 Its diameter is

(a) 7 cm
(b) 14 cm
(c) 21 cm
(d) 28 cm

Answer: b

Explaination: Reason: Here area of the circle, A = 154 cm², Radius, r = ?

Area of the circle = 154 cm² …(Given)

∴ πr² = 154

⇒ $22/7$ × r² = 154

⇒ r² = 154 × 7/22= 7 × 7

⇒ r = 7 cm

∴ Diameter of the circle = 2 × r = 2 × 7 = 14 cm

7. The area of the circle that can be inscribed in a square of side 6 cm, is

(a) 18π cm²
(b) 12π cm²
(c) 9π cm²
(d) 14π cm²

Answer: c
Explanation: Reason: Size of square = 6 cm, radius = $\frac{6}{2}$ = 3 cm;
Area of the circle = $\pi r^2 = \pi \times 3 \times 3 = 9\pi$ cm²

8. The radii of two circles are 4 cm and 3 cm respectively. The diameter of the circle having area equal to the sum of the areas of the two circles (in cm) is
(a) 5
(b) 7
(c) 10
(d) 14

Answer: c
Explanation:

$$(c) \quad \pi R^2 = \pi r_1^2 + \pi r_2^2$$
$$= \pi\left[r_1^2 + r_2^2\right] = \pi[4^2 + 3^2]$$
$$\Rightarrow \quad R^2 = 25 \Rightarrow R = 5 \text{ cm}$$
$$d = 5 \times 2 = 10 \text{ cm}$$

9. If the area of a circle is numerically equal to twice its circumference, then the diameter of the circle is
(a) 4 units
(b) n units
(c) 8 units
(d) 2 units

Answer: c
Explanation:
(c) $\pi r^2 = 2\pi r \times 2$
$\Rightarrow r = 4$
$\Rightarrow 2r = 8$ units

10. If the circumference of a circle is 352 metres, then its area in square metres is
(a) 5986
(b) 6589
(c) 7952
(d) 9856

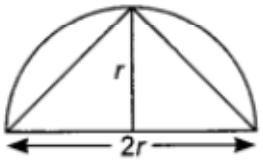
Answer: d
Explanation:

$$(d) \quad \because \quad 2\pi r = 352 \Rightarrow r = \frac{176}{\pi}$$
$$\therefore \text{ Area} = \pi r^2 = \frac{\pi \times 176 \times 176}{\pi \times \pi}$$
$$= \frac{176 \times 176 \times 7}{22} = 9856 \text{ m}^2$$

11. Area of the largest triangle that can be inscribed in a semi-circle of radius r units is
    (a) r² sq. units
    (b) 12 r² sq. units
    (c) 2 r² sq. units
    (d) √2 r² sq. units
    Answer: a
    Explanation:
    (a) Area of triangle

$$= \frac{1}{2} \times \text{base} \times \text{altitude}$$

$$= \frac{1}{2} \times 2r \times r = r^2 \text{ sq. units}$$



12. If the circumferences of two circles are in the ratio 4 : 9, then the ratio in their area is
    (a) 9 : 4
    (b) 4 : 9
    (c) 2 : 3
    (d) 16 : 81

    Answer: d
    Explanation:

$$(d)\ \frac{2\pi r_1}{2\pi r_2} = \frac{4}{9} \Rightarrow \frac{r_1}{r_2} = \frac{4}{9}$$

$$\text{Now } \frac{\pi r_1^2}{\pi r_2^2} = \left(\frac{r_1}{r_2}\right)^2 = \left(\frac{4}{9}\right)^2 = \frac{16}{81}$$

$$\therefore \text{ Ratio of areas} = 16 : 81$$

13. The ratio of the areas of the incircle and circumcircle of a square is
    (a) 1 : 2
    (b) 1 : 3
    (c) 1 : 4
    (d) 1 : √2
    Answer: a
    Explanation:
    (a) Let side of square = x units
    ∴ Diagonal of the square = √2 x units
    Diameter of the incircle = x units

Diameter of the circumcircle = $\sqrt{2}$ x units

$$\therefore \frac{\text{Area of incircle}}{\text{Area of circumcircle}}$$

$$= \frac{\pi\left(\frac{x}{2}\right)^2}{\pi\left(\frac{\sqrt{2}x}{2}\right)^2} = \frac{1}{2}.$$

14. Area of quadrant of a circle is
    (a) $\pi r^2 / 4$
    (b) πr
    (c) $\pi /4$
    (d) 4π
    Answer: a

15. Area of semi circle is

    (a) $\pi r^2 /2$

    (b) 2π

    (c) $\pi / 2r$

    (d) πr
    Answer: a

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