

Area & volume Solved Sums

1. How many cubes of 3 cm edge can be cut out a cube of 18 cm edge ?

A) 36 b) 216 c) 216 d) 412

Answer :

$$\Rightarrow \frac{\text{large side}}{\text{smaller side}}$$

$$= \frac{18^3}{3^3} = \frac{18 \times 18 \times 18}{3 \times 3 \times 3} = 6 \times 6 \times 6 = 216$$

Ans : 216

2. Find the volume of a sphere radius 10.5cm

A) 1286 cm² b) 4851 cm² c) 3657 cm² d) 2456 cm²

Answer :

$$\Rightarrow \text{volume of sphere} = \frac{4}{3} \times \pi r^3$$

$$\Rightarrow \frac{4}{3} \times \frac{22}{7} \times 10.5 \times 10.5 = 4851 \text{ cm}^3$$

Ans : 4851 cm³

3. The metallic sphere of radius 12cm is melted into three smallest sphere. if the radii of two smaller sphere are 6cm and 8cm. the radius of the third sphere is

a) 14cm b) 16cm c) 10 cm d) 12 cm

Answer :

$$\Rightarrow \frac{\frac{4}{3} \times \frac{22}{7} \times 12 \times 12 \times 12}{\left(\frac{4}{3} \times \frac{22}{7} \times 8 \times 8 \times 8\right) + \left(\frac{4}{3} \times \frac{22}{7} \times 6 \times 6 \times 6\right) + \left(\frac{4}{3} \times \frac{22}{7} \times x \times x \times x\right)}$$

$$\frac{\frac{4}{3} \times \frac{22}{7} \times 12 \times 12 \times 12}{\left(\frac{4}{3} \times \frac{22}{7}\right) (512) + (216) + x^{\text{power}3}} = \frac{1728}{728 + x^{\text{power}3}}$$

$$= x^3 = 1000 \Rightarrow x = 10 \text{ cm}$$

Ans : 10cm

4. For what value of radius of a sphere the volume of the sphere is numerically equal to the surface area of the sphere ?

A) 1 b) 2 c) 3 d) 4

Answer :

⇒ Volume of sphere = surface of sphere

$$= > \frac{4}{3} \times \pi \times r^3 = 4 \times \pi \times r^2$$

$$R = 3$$

Ans = 3 cm

5 . What is the least number of square marbles required for a terrace of 15.17m long and 9.02m Breath?

Answer :

$$= > 15.17\text{m} = 1517\text{cm} ,$$

$$= > 9.02\text{m} = 902\text{cm} ,$$

⇒ HCF of 1517 and 902 => 41cm

⇒ AREA of tiles = 41 X 41

$$= > \frac{1517 \times 902}{41 \times 41} = 814$$

Ans : 814

6 . The capacity of a cylinder tank is 246.4 litres. If the weight is 4 metres what is the diameter of the base ?

- A) 1.4m b) 2.8m c) 0.14 m d) 0.28m

Answer :

$$= > \text{volume of cylinder} = \pi r^2 h$$

$$= > \frac{22}{7} \times r^2 \times 4 = 246.4$$

$$\Rightarrow \frac{22}{7} \times r^2 \times 400 = 246400 = > (4\text{m} = 400\text{cm})$$

$$= r^2 = 196 \quad = > r = 14 \quad 2r = 28\text{cm}$$

$$28\text{cm} = 0.28\text{m}$$

Ans : 0.28m

7 . If side of an equilateral triangle is decreased by 20 % its area is decreased by ,

- A) 42 % b) 36 % c) 34 % d) 20 %

Answer :

Equilateral triangle $\frac{\sqrt{3}}{4}a^2$

= > Area is not given then take area = 100

= > $100 \times \frac{80}{100} \times \frac{80}{100}$ [$a^2 = \text{area} \Rightarrow 80 \times 80$]

= > 64 = > $100 - 64 = 36\%$

Ans : 36 %

8 . The area of a circle is 220 cm^2 then the area of the square inscribed in the circle is

A) 180 cm^2 b) 140 cm^2 c) 135 cm^2 d) 250 cm^2

Answer :

Area of circle $\pi r^2 = 220 \text{ cm}^2$

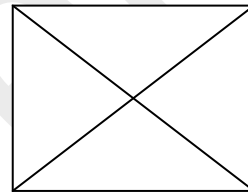
$R^2 = 70 \text{ cm}$

= > $r = \frac{1}{2} (\text{diagonal}) \rightarrow \text{diagonal} = 2r$

= > area of square = $\frac{1}{2} (\text{diagonal})^2$

= > $\frac{1}{2} \times 4r^2 = 2r^2 = 2 \times 70$

Ans : 140 cm^2



9 . If the radius of a circle is doubled area is multiplied by

A) 3 b) 2 c) 4 d) 8

Answer :

= > radius of circle is = 100

= > $100 \times \frac{200}{100} \times \frac{200}{100} = 400$

= > 100 to 400 = > 4 times

Ans : 4

10. A square is inscribed in a circle whose radius is 4cm. The area of the portion between the circle and square is

A) $16\pi - 32 \text{ cm}^2$ b) $32\pi - 27 \text{ cm}^2$ c) $20\pi + 11 \text{ cm}^2$ d) $12\pi - 4 \text{ cm}^2$

Answer : R = 4cm

= > area of circle = $\pi r^2 = 16\pi$

$$R = \frac{1}{2} (\text{diagonal}) \Rightarrow \text{diagonal} = 2R$$

$$\Rightarrow \text{Area of square} = \frac{1}{2} (\text{diagonal})^2 = \frac{1}{2} (8)^2$$

$$\Rightarrow \frac{1}{2} (64) = 32\text{cm}^2$$

$$\Rightarrow \text{circle and square} = 16\pi - 32\text{cm}^2$$

$$\text{Ans : } 16\pi - 32\text{cm}^2$$

11 . If length and breath of a rectangle became half and double respectively, Then what will be the % increase in resultant area ?

A) 0 % b) 65 % c) 75 % d) 80 %

Answer : \Rightarrow length = 100 % breath = 100 %

$$\Rightarrow 100 \times \frac{50}{100} \times \frac{200}{100} = 100 \% \Rightarrow \text{same}$$

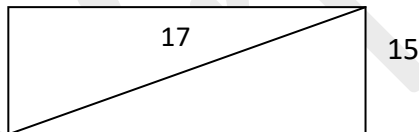
\Rightarrow Then area = 0 % increase

Ans : 0 %

12. The side of a rectangular field is 15m and one of its diagonal is 17m then the area of its field is ?

A) 32 m² b) 120 m² c) 2 m² d) 60m²

Answer :



$$\Rightarrow (\text{Formula})^2 = (\text{page})^2 + (\text{page})^2$$

$$(17)^2 = (15)^2 + x^2$$

$$= 289 - 225 = 64 = x^2$$

$$\Rightarrow x^2 = 64 \Rightarrow x = 8$$

= Area of rectangle

$$= 15 \times 8 = 120\text{cm}^2$$

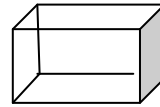
Ans : 120 cm²

13 . The perimeter of the four of a cube is 20 cm is a volume be ,

- A) 215cm³ b) 200cm³ c) 125cm³ d) 800cm³

Answer :

⇒ perimeter of cube is , 4a



= > 4a = 20 => a = 5

- a³ = 5 X 5 X 5 = 125 cm³
- volume of cube is = 125cm³

Ans : 125cm³

14 . What is the volume of a cube whose diagonal measure is $4\sqrt{3}cm$

- A) 30 cm³ b) 46cm³ c) 60cm³ d) 64cm³

Answer :

= > diagonal of cube $l = \sqrt{3} a$

= > $4\sqrt{3} = \sqrt{3}a$ => a = 4

⇒ volume of cube = a³

a³ = 4 X 4 X 4 = 64cm³

Ans : 64cm³

15 . How many cube of 10 cm edge be put in a cubical box of 1m edge >

- A) 200 b) 1000 c) 10 d) 100

Answer :

1m = 100cm ,

⇒ volume of cube = a³

$$\Rightarrow \frac{\text{large side}}{\text{smallside}} = \frac{100 \times 100 \times 100}{10 \times 10 \times 10} = 1000$$

Ans : 1000

16 . How many cubes 30cm edge can be cut out of a cubaid 3cm X 18Cm X 108Cm ?

- A) 216 b) 326 c) 36 d) 45

Answer :

$$\frac{\text{large side}}{\text{smaller side}} = \frac{3 \times 18 \times 108}{3 \times 3 \times 3} = 216$$

Ans : 216

17. The capacity of a tank of dimension (8m X 6m X 2.5m) is

- A) 120000 litre b) 100000 litre c) 50000 litre d) 80000 litre

Answer :

$$\Rightarrow \text{volume of cuboid} = 8 \times 6 \times 2.5 = 120 \text{ metres}$$

$$\Rightarrow 1 \text{ meter} = 1000 \text{ litre}$$

$$\Rightarrow 120 \times 1000 = 120000 \text{ litre}$$

Ans : 120000 litre .

18. The ratio of the radii of two cylinder 2 : 3 and the ratio of their heights is 5 : 8 . The ratio of their volumes will be

- A) 4 : 9 b) 9 : 4 c) 20 : 27 d) 27 : 20

Answer :

$$\Rightarrow R_1 : r^2 = 2 : 3 \quad , \quad H_1 : H_2 = 5 : 8$$

$$\text{Volume of cylinder} = \pi r^2 h$$

$$\Rightarrow \pi \times 2 \times 2 \times 5 : \pi \times 3 \times 3 \times 8$$

$$\Rightarrow 20 : 27$$

Ans : 20 : 27

19. One side of a parallogram is 18cm and its distance from the opposite is is 8cm . The area of the parallogram is

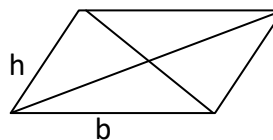
- A) 160cm² b) 210cm² c) 144cm² d) 140cm²

Answer :

$$\Rightarrow \text{area of parrallogram} = b \times h$$

$$\Rightarrow 18 \times 8 = 144 \text{cm}^2$$

Ans : 144cm²



20. Find the length of the altitude of an equilateral triangle of side $3\sqrt{3} \text{ cm}$

- A) 27cm b) $9\sqrt{3} \text{ cm}$ c) 9 cm d) 4.5 cm

Answer :

$$\Rightarrow \text{equilateral side} = 3\sqrt{3} \text{ cm}$$

$$\Rightarrow \text{area of equilateral triangle} = \frac{\sqrt{3}}{4} a^2$$

$$= \frac{\sqrt{3}}{4} (3\sqrt{3})^2 \Rightarrow \frac{\sqrt{3}}{4} \times (9 \times 3) \Rightarrow = \frac{27\sqrt{3}}{4}$$

$$\Rightarrow \frac{1}{2} \times b \times h = \frac{27\sqrt{3}}{4} [\text{h - altitude}]$$

$$\Rightarrow \frac{1}{2} \times 3\sqrt{3} \times h = \frac{27}{4} \sqrt{3} \Rightarrow h = \frac{27\sqrt{3} \times 2}{3\sqrt{3} \times 4}$$

$$\Rightarrow h = 4.5 \text{ cm}$$

Ans : 4.5 cm

21 . The length of rectangle is increased by 60 % by what percent would the width have to be increased so as to maintain the same area .

A) 37.5 % b) 60 % c) 75 % d) 120 %

Answer :

$$\Rightarrow \text{length} = 60 \% \text{ increase} = 160 \%$$

$$\Rightarrow 100 \times \frac{160}{100} \times \frac{x}{100} = 100 \Rightarrow x = \frac{100 \times 100 \times 100}{100 \times 160}$$

$$\Rightarrow x = 62.5 \Rightarrow 100 - 62.5 \% \Rightarrow 37.5 \%$$

Ans : 37.5%

22 . a cone a hemisphere and a cylinder stands on equal base and have the same height Find the ratio of their volume

A) 3 : 2 : 1 b) 1 : 2 : 3 c) 3 : 1 : 2 d) 1 : 3 : 2

Answer :

$$\Rightarrow \text{Volume of cone} = \frac{1}{3} \Pi r^2 h$$

$$\Rightarrow \text{volume of hemisphere} = \frac{2}{3} \Pi r^2 h \quad R = h$$

$$\text{Volume of cylinder} = \Pi r^2 h$$

Cone : hemisphere : cylindre

$$\frac{1}{3} \Pi r^2 \times r \quad : \quad \frac{2}{3} \Pi r^3 \quad : \quad \Pi r^2 \times r$$

$$\Rightarrow \frac{1}{3} : \frac{2}{3} : \frac{1}{1}$$

$$\Rightarrow 1 : 2 : 3 = \text{ratio}$$

Ans : 1 : 2 : 3

23 . AS air is pumped in to a spherical balloon the radius increase from 6 cm to 12cm . The ratio between volume of the balloon in the beginning and the end is

A) 1 : 8 b) 2 : 7 c) 8 : 1 d) 2 : 3

Answer :

$$= > \text{volume of sphere} = \frac{4}{3} \Pi r^3$$

$$\Rightarrow \frac{4}{3} \times \Pi \times 6 \times 6 \times 6 : \frac{4}{3} \times \Pi \times 12 \times 12 \times 12$$

$$\Rightarrow 1 : 8$$

Ans : 1 : 8

24 . The difference between two parallel sides of a trapezium is 4cm . The perpendicular distance is 19cm . If the area of the trapezium is 475 cm² Find the length of the parallel side

A) 20 cm, 16cm b) 27cm , 23cm c) 27cm , 20 cm d) 25cm , 23 cm

Answer :

$$\Rightarrow \text{Parallel side} = a, b \Rightarrow a = a - 4$$

$$\Rightarrow h = 19\text{cm},$$

$$\Rightarrow \text{Area of trapezium} = \frac{1}{2} \times (a + b)$$

$$\Rightarrow \frac{1}{2} \times 19 \times [a + (a - 4)] = 475$$

$$\Rightarrow \frac{1}{2} \times 19 (2a - 4) = 475 \Rightarrow \frac{1}{2} \times 38a - 76 = 475$$

$$\Rightarrow 38a = 1026 \Rightarrow a = 1026/3 \Rightarrow a = 27$$

$$B = 27 - 4 = 23$$

Ans : 27 , 23 cm

25 . The perimeter of two squares are 40cm and 32cm. Find the perimeter of a third square whose area is equal to the difference of the area of two squares.

A) 40cm b) 36cm c) 12cm d) 24cm

Answer:

= > perimeter of square = $4a$
 = > $4a = 40$ $a = 10$ $4a = 32$ $a = 8$
 = > area of square = a^2
 = > $a^2 = 10 \times 10 = 100$: $a^2 = 8 \times 8 = 64$
 = > $100 - 64 = 36$ $\Rightarrow a = 6$
 \Rightarrow Third square $4a = 4 \times 6 = 24\text{cm}$

Ans : 24 cm

26 . A river of 1.5m deep and 36m wide is flowing at the rate of 3.5 km per hour . The amount of water that runs into the sea per minute is

- A) 3150m^3 b) 31500m^3 c) 6300m^3 d) 63000m^3

Answer :

H = 1.5 m deep , b = 36m wide
 = > $b \times h = 1.5 \times 36 = 54\text{m}$,
 = > $1\text{km} = 1000\text{m}$, 1 hour = 60 minute
 $\Rightarrow \frac{3.5 \times 1000}{1 \times 60} = \frac{3500}{60} = \frac{350}{6} \text{m/min} = l$
 = > $l \times b \times h = \text{amount of water}$
 = > $\frac{350}{6} \times 54 = 3150\text{m}^3$

Ans : 3150m^3

27 . The total surface area of a solid hemisphere of a diameter 2cm is equal to ,

- A) 12cm^2 b) $12\pi\text{cm}^2$ c) $4\pi\text{cm}^2$ d) $3\pi\text{cm}^2$

Answer :

Diameter $2r = 2\text{cm} \Rightarrow r = 1\text{cm}$
 = > total surface area of hemisphere = $3\pi r^2$
 $\Rightarrow 3 \times \pi \times 1 \times 1 = 3\pi\text{cm}^2$

Ans : $3\pi \text{cm}^2$

28 . The radius and height of cylinder and cone are equal. If the volume of cylinder is 120 cm ? Then the volume of cone is

A) 90cm^2 b) 30cm^2 c) 30cm^2 d) 100cm^2

Answer :

$$\Rightarrow \text{Volume of cylinder} = \Pi r^2 h$$

$$\Pi r^2 h = 120\text{cm}^3$$

$$\Rightarrow \text{volume of cone} = \frac{1}{3} \Pi r^2 h$$

$$\frac{1}{3} \times \Pi r^2 h = \Rightarrow \frac{1}{3} \times 120 = 40\text{cm}^3$$

Ans : 40cm^3

29 . The raddi of two cones are in the ratio 2 : 1 their volumes are equal . Find the ratio of their heights

A) 1 : 8 b) 1 : 8 c) 2 : 1 d) 4 : 1

Answer :

$$\Rightarrow R_1 : R_2 = 2 : 1 \quad , \quad \text{volume are equal}$$

$$\frac{1}{3} \Pi \times 2 \times 2 \times h_1 : \frac{1}{3} \Pi \times 1 \times 1 \times h_2$$

$$\Rightarrow 4 h_1 : 1 h_2$$

$$\Rightarrow h_1 : h_2 = 1 : 4$$

Ans : 1 : 4

30 . the rectangular piece of paper has length $14 \Pi \text{cm}$ and breath $\frac{10}{\Pi} \text{cm}$. A cylinder is formed by one rolling of the paper along its breath, The volume of the cylinder is

A) 980cm^3 b) 1960cm^3 c) 140cm^3 d) 490cm^3

Answer :

$$\Rightarrow \text{Circumprence of circle} = 2\Pi r = 14\Pi$$

$$\Rightarrow r = 7$$

$$\Rightarrow h = \frac{10}{\Pi} \text{cm} ,$$

$$\Rightarrow \text{volume of cylinder} = \Pi r^2 h$$

$$\Rightarrow \Pi \times (7)^2 \times \frac{10}{\Pi} = 490\text{cm}^3$$

Ans = 490cm^3