



MATHS

BOOKS - PEARSON IIT JEE FOUNDATION

MENSURATION

Example

1. The hour hand of a clock is 6 cm long. Find the area swept by it between $11:20am$ and $11:55am$ ($incm^2$)

A. 2.75

B. 5.5

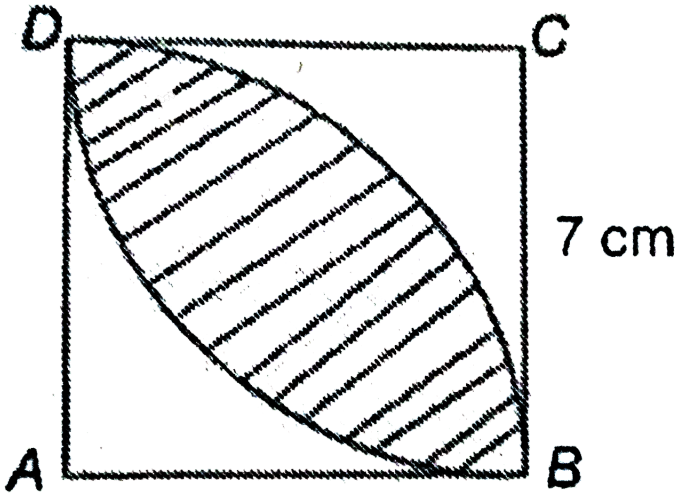
C. 11

D. None of these

Answer: B

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2. In the figure given below, $ABCD$ is a square of side 7cm . BD is an arc of a circle of radius AB .



A. 14cm^2

B. 21cm^2

C. 28cm^2

D. 35cm^2

Answer: C



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3. The base of a right prism is a right angled triangle. The measure of the base of the right angled triangle is 3 m and its height 4 m. If the height of the prism is 7 m. then find

- (a) the number of edges of the prism.
- (b) the volume of the prism.
- (c) the total surface area of the prism.



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4. The dimensions of a room are $12\text{m} \times 7\text{m} \times 5\text{m}$. Find the diagonal of the room.

- (b) the cost of flooring at the rate of Rs. 2 per m^2 .

(c) the cost of whitewashing the room excluding the floor at the rate of Rs. 3 per m^2 .



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5. A box is in the form of a cube. Its edge is 5 m long. Find

(a) the total length of the edges.

(b) the cost of outside of the box, on all the surfaces, at the rate of Rs. 5 per m^2 .

(c) the volume of liquid which the box can hold.



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6. The sum of the length, breadth and the height of a cuboid is $5\sqrt{3}$ cm and length of its diagonal is $3\sqrt{5}$ cm. Find the total surface area of the cuboid.

A. $30cm^2$

B. 20cm^2

C. 15cm^2

D. 18cm^2

Answer: C



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7. A closed cylindrical container, the radius of which is 7 cm and height 10 cm is to be made out of a metal sheet. Find

(a) the area of metal sheet required .

(b) the volume of the cylinder made.

(c) the cost of painting the lateral surface of the cylinder at the rate of Rs. 4 per cm^2 .



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8. A cylindrical tank with radius 60 cm is being filled by a circular pipe with internal diameter of 4 cm at the rate of 11 m/s. Find the height of the water column in 18 minutes.

- A. 66 m
- B. 12.2 m
- C. 13.2 m
- D. 6.1 m

Answer:



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9. An hexagonal pyramid is 20 m high. Side of the base is 5 m. Find the volume and the slant height of the pyramid.



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10. Find the volume of the greatest right circular cone, which can be cut from a cube of a side 4 cm. (in cm^3)

A. $\frac{12\pi}{5}$

B. $\frac{20\pi}{3}$

C. $\frac{18\pi}{5}$

D. $\frac{16\pi}{3}$

Answer: D



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11. A Joker's cap is in the form of a cone of radius 7 cm and height 24 cm. Find the area of the cardboard required to make the cap.



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12. The diameter of an icecream cone is 7 cm and its height is 12 cm.

Find the volume of icecream that the cone can contain.

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13. The diameters of top and bottom portions of a milk can are 56 cm and 14 cm respectively. The height of the can is 72 cm . Find the

(a) area of metal sheet required to make the can (without lid).

(b) volume of milk which the container can hold.

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14. From a circular canvas of diameter 56 m, a sector of 270° was cut out and a conical tent was formed by joining the straight ends of this piece. Find the radius and the height of the tent.

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15. The cost of painting a solid sphere at the rate of 50 paise per square metre is Rs. 1232. Find the volume of steel required to make the sphere.



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16. A hollow hemispherical bowl of thickness 1 cm has an inner radius of 6 cm. Find the volume of metal required to make the bowl.



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17. A thin hollow hemispherical sailing vessel is made of metal covered by a conical canvas tent. The radius of the hemisphere is 14 m and total height of vessel (including the height of tent) is 28 m. Find area of metal of metal sheet and the canvas required.

A. 1235

B. 1234

C. 1233

D. 1232

Answer: *D*



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18. A wafer cone is completely filled with icecream forms a hemispherical scoop, just covering the cone. The radius of the top of the cone, as well as the height of the cone are 7 cm each. Find the volume of the icecream in it (in cm^3). (Take $\pi = 22/7$ and ignore the thickness of the cone)

A. 1176

B. 1980

C. 1078

D. 1274

Answer:



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19. A joker's cap is in the form of a right circular cone of base radius 7 cm and height 24 cm. Find the area of the sheet required to make 10 such caps.

A. 6000cm^2 .

B. 5000cm^2 .

C. 5500cm^2 .

D. 5560cm^2 .

Answer: C



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1. If the length of the side of an equilateral triangle is 12 cm, then what is its in-radius?

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2. The radius of a circle is 8 cm and O is its centre. If $\angle AOB = 60^\circ$ and AB is a chord, then what is the length of the chord AB?

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3. The circum-radius of an equilateral triangle is x cm. What is the perimeter of the triangle in terms of x?

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4. If the difference between the outer radius and the inner radius of a ring is 14 cm, then what is the difference between its outer

circumference and inner circumference?



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5. The area of a ring is 22 cm^2 . What is the difference of the square of the outer radius and the square of the inner radius?



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6. A cone is formed by joining together the two straight edges of a sector, so that they coincide with each other. The length of the arc of the sector becomes the _____ of the circular base and radius of sector becomes the _____ of the cone.



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7. The volume of a cube with diagonal d is _____.



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8. If the total surface area of a cube is $\frac{50}{3}m^2$, then find its side.



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9. Find the maximum number of soaps of size $2cm \times 3cm \times 5cm$ that can be kept in a cuboidal box of dimensions $6cm \times 3cm \times 15cm$.



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10. Total number of faces in a prism which has 12 edges is _____.



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11. W, P, H and A are whole surface area, perimeter of base, height and area of the base of a prism respectively. The relation between W, P, H and A is _____.



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12. If s is the perimeter of the base of a prism, n is the number of sides of the base, S is the total length of the edges and h is the height, then S = _____.



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13. If the number of lateral surfaces of a right prism is equal to n , then the number of edges of the base of the prism is _____.



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14. If f , e , and v represent the number of rectangular faces, number of edges and number of vertices respectively of a cuboid, then the values of f , e , and v respectively are _____.



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15. Find the number of vertices of a pyramid, whose base is a pentagon.

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16. A and B are the volumes of a pyramid and a right prism respectively. If the pyramid and the prism have the same base area and the same height, then what is the relation between A and B?

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17. If the ratio of the base radii of two cones having the same curved surface areas is 6 : 7, then the ratio of their slant heights is _____.

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18. The heights of two cones are equal and the radii of their bases are R and r . The ratio of their volumes is _____.

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19. If the heights of two cylinders are equal and their radii are in the ratio of $7:5$, then the ratio of their volumes is _____.

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20. Volumes of two cylinders of radii R, r and heights H, h respectively are equal. Then $R^2H =$ _____.

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21. The volumes of two cylinders of radii R, r and heights H, h respectively are equal. If $R:r = 2:3$, then $H:h =$ _____.



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22. A sector of a circle of radius 6 cm and central angle 30° is folded into a cone such that the radius of the sector becomes the slant height of the cone. What is the radius of the base of the cone thus formed?



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23. If R and r are the external and the internal radii of a hemispherical bowl, then what is the area of the ring, which forms the edge of the bowl (in sq. units)?



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24. What is the volume of a hollow cylinder with R , r and h as outer radius, inner radius and height respectively?



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25. The side of a cube is equal to the radius of the sphere. Find the ratio of their volumes.



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26. A sphere and the base of a cylinder have equal radii. The diameter of the sphere is equal to the height of the cylinder. The ratio of the curved surface area of the cylinder and surface area of the sphere is _____.



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27. A road roller of length $3l$ m and radius $\frac{l}{3}m$ can cover a field in 100 revolutions, moving once over. The area of the field in terms of l is _____ m^3 .



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28. What is the volume of sand to be spread uniformly over a ground of dimensions. $10xm \times 8xm$ up to a height of $0.1x$ m?



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29. The outer radius and the inner radius of a hollow cylinder are $(3 - x)cm$ and $(2 - x)cm$. What is its thickness?



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30. The slant height, outer radius and inner radius of a cone frustum are $2a$ cm, $(a + b)$ cm and $(a - b)$ cm. What is its curved surface area?



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Short Answer Type Questions

1. A circle is inscribed in an equilateral triangle. If the in-radius is 21 cm, what is the area of the triangle?



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2. Three cubes each of side 3.2 cm are joined end to end. Find the total surface area of the resulting cuboid.



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3. A square is drawn with the length of side equal to the diagonal of a cube. If the area of the square is 72075cm^2 , then find the side of the cube.



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4. What is the area of a ground that can be levelled by a cylindrical roller of radius 3.5 m and 4 m long by making 10 rounds?

A. 880 m^2

B. 890 m^2

C. 830 m^2

D. 810 m^2

Answer: A



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5. A square of side 28 cm is folded into a cylinder by joining its two sides. Find the base area of the cylinder thus formed.



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6. Find the number of cubes of side 2 m to be dropped in a cylindrical vessel of radius 14 m in order to increase the water level by 5 m.



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7. Find the capacity of a closed cuboidal cistern whose length is 3 m, breadth is 2 m and height is 6 m. Also find the area of iron sheet required to make the cistern.



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8. An open metallic conical tank is 6 m deep and its circular top has diameter of 16 m. Find the cost of plating its inner surface at the rate of 0.8 per 100 cm². (Take $\pi = 3.14$)



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9. The total surface area of a hemisphere is 3768cm^2 . Find the radius of the hemisphere. (Take $\pi = 3.14$)



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10. The base radius of a conical tent is 120 cm and its slant height is 750 cm . Find the area of the canvas required to make 10 such tents (in m^2). (Take $\pi = 3.14$)



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11. From a cylindrical wooden log of length 30 cm and base radius $7\sqrt{2}\text{ cm}$, biggest cuboid of square base is made. Find the volume of wood wasted.



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12. A right circular cone is such that the angle at its vertex is 90° and its base radius is 49 cm, then find the curved surface area of the cone.



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13. The base of a right pyramid is an equilateral triangle, each side of which is $6\sqrt{3}$ cm long and its height is 4 cm. Find the total surface area of the pyramid in cm^2 .



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14. If the thickness of a hemispherical bowl is 12 cm and its outer diameter is 10.24 m, then find the inner surface area of the hemisphere. (Take $\pi = 3.14$).



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15. A spherical piece of metal of diameter 6 cm is drawn into a wire of 4 mm in diameter. Find the length of the wire.

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16. Find the capacity of a closed rectangular cistern whose length is 8 m, breadth 6 m and depth 2.5 m. Also, find the area of the iron sheet required to make the cistern .

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17. An open metallic conical tank is 6 m deep and its circular top has diameter of 16 m. Find the cost of plating its inner surface at the rate of 0.8 per 100 cm². (Take $\pi = 3.14$)

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18. The total surface area of a hemisphere is 3768cm^2 . Find the radius of the hemisphere. (Take $\pi = 3.14$)



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19. The base radius of a conical tent is 120 cm and its slant height is 750 cm. Find the area of the canvas required to make 10 such tents (in m^2). (Take $\pi = 3.14$)



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Essay Type Questions

1. The cost of the canvas required to make a conical tent of base radius 8 m at the rate of Rs. 40 per m^2 is Rs. 10048. Find the height of the tent. (Take $\pi = 3.14$)



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2. A hollow sphere which has internal and external diameter as 16 cm and 14 cm respectively is melted into a cone with a height of 16 cm. Find the diameter of the base of the cone.



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3. A drum in the shape of a frustum of a cone with radii 24 ft and 15 ft and height 5 ft is full of water. The drum is emptied into a rectangular tank of base 99 ft \times 43 ft. Find the rise in the height of the water level in the tank.



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4. A cylindrical tank of radius 7 m, has water to some level. If 110 cubes of side 7 dm are completely immersed in it, then find the rise in the water level in the tank. (in meters)





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5. A drum is in the shape of a frustrum of a cone with radii 24ft and 15ft and height 5ft is full of water. The drum is emptied into a rectangular tank of base 99ft×43ft. Find the rise in the height of the water level in the tank.



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Level 1

1. The area of a sector whose perimeter is four times its radius (r units) is

A. \sqrt{r} sq. units.

B. r^4 sq. units.

C. r^2 sq. units.

D. $\frac{t^2}{2}$ sq. units.

Answer: C



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2. A chord of a circle of radius 28 cm makes an angle of 90° at the centre. Find the area of the major segment.

A. 1456 cm^2

B. 1848 cm^2

C. 392 cm^2

D. 2240 cm^2

Answer: C



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3. The area of a circle inscribed in an equilateral triangle is 48π square units. What is the perimeter of the triangle?

A. $17\sqrt{3}$ units

B. 36 units

C. 72 units

D. $48\sqrt{3}$ units

Answer: D



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4. Two circles touch each other externally. The distance between the centres of the circles is 14 cm and the sum of their areas is 308 cm^2 .

Find the difference between radii of the circles. (in cm)

A. 1

B. 2

C. 0

D. 0.5

Answer: D



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5. If the outer and the inner radii of a circular track are 7 m and 3.5 m respectively, then the area of the track is _____.

A. 100 m^2

B. 178 m^2

C. 115.5 m^2

D. 135.5 m^2

Answer: A



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6. The base of a right pyramid is an equilateral triangle of perimeter 8 dm and the height of the pyramid is $30\sqrt{3}$ cm. Find the volume of the pyramid.

A. 16000cm^3

B. 1600cm^3

C. $\frac{16000}{3}\text{cm}^3$

D. $\frac{5}{4}\text{cm}^3$

Answer: C



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7. The volume of a cuboid is $20\sqrt{42}\text{m}^3$. Its length is $5\sqrt{2}$ m, breadth and height are in the ratio $\sqrt{3} : \sqrt{7}$. Find its height.

A. $\sqrt{7}$ m

B. $3\sqrt{7}$ m

C. $4\sqrt{7}$ m

D. $2\sqrt{7}$ m

Answer: C



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8. A metal cube of edge $\frac{3\sqrt{2}}{\sqrt{5}}$ m is melted and formed into three smaller cubes. If the edges of the two smaller cubes are $\frac{3}{\sqrt{10}}$ m and $\frac{\sqrt{5}}{\sqrt{2}}$ m, find the edge of the third smaller cube.

A. $\frac{3}{\sqrt{7}}$ m

B. $\frac{6}{\sqrt{15}}$ m

C. $\frac{5}{\sqrt{11}}$ m

D. $\frac{4}{\sqrt{10}}$ m

Answer: D



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9. Find the volume of the space covered by rotating a rectangular sheet of dimensions $16.1\text{cm} \times 7.5\text{cm}$ along its length.

A. 2846.25 cm^3

B. 2664 cm^3

C. 2864 cm^3

D. 2684 cm^3

Answer: D



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10. The base of a right prism is an equilateral triangle of edge 12 m. If the volume of the volume of the prism is $288\sqrt{3}\text{m}^3$, then its height is

_____.

A. 6 m

B. 8 m

C. 10 m

D. 12 m

Answer: B



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11. A roller levelled an area of 165000 m^2 in 125 revolutions, whose length is 28 m. Find the radius of the roller.

A. 7.5 m

B. 8.5 m

C. 6.5 m

D. 7 m

Answer: A



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12. A large sphere of radius 3.5 cm is carved from a cubical solid. Find the difference between their surface areas.

A. 122 cm^2

B. 80.5 cm^2

C. 144.5 cm^2

D. 140 cm^2

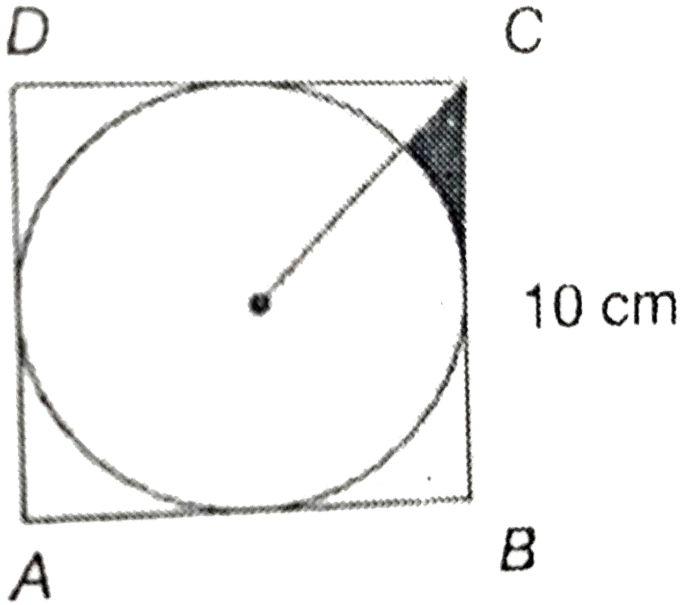
Answer: D



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13. In the figure given below, ABCD is a square of side 10 cm and a circle is inscribed in it. Find the area of the shaded part as shown in the

figure.



A. $\left(\frac{100 - 36\pi}{41}\right) cm^2$

B. $\left(\frac{100 - 25\pi}{8}\right) cm^2$

C. $\left(\frac{100 + 25\pi}{8}\right) cm^2$

D. None of these

Answer: B



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14. The outer curved surface area of a cylindrical metal pipe is 1100 m^2 and the length of the pipe is 25 m. The outer radius of the pipe is _____.

A. 8 m

B. 9 m

C. 7 m

D. 6 m

Answer: C



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15. The volume of a hemisphere is $2.25\pi\text{ cm}^3$. What is the total surface area of the hemisphere?

A. $2.25\pi\text{ cm}^2$

B. $5\pi\text{ cm}^2$

C. $6.75\pi cm^2$

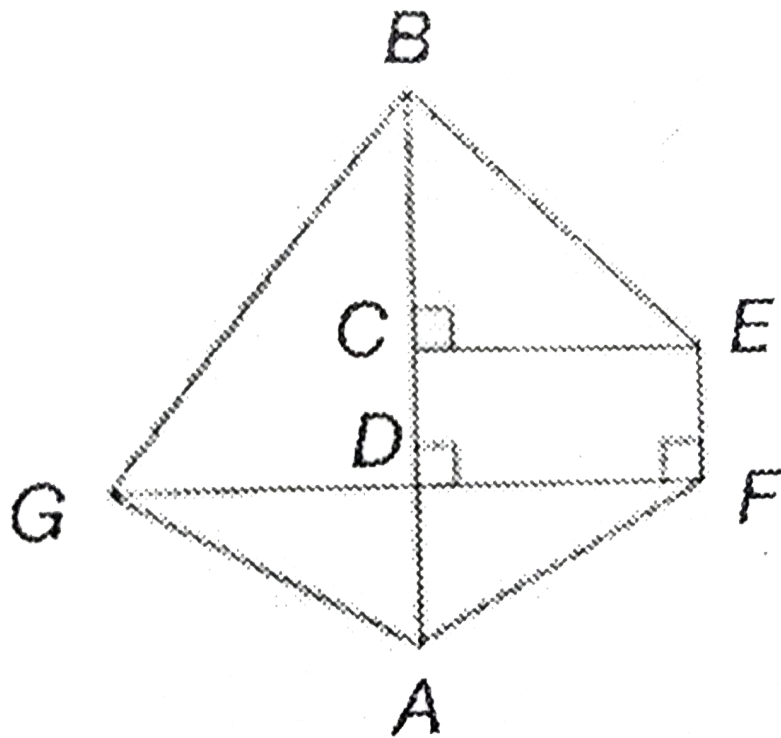
D. $4.5\pi cm^2$

Answer: C



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16. Find the area of the figure given below, in which $AB = 100$ m, $CE = 30$ m, C is mid-point of \overline{AB} and D is mid-point of \overline{AC} and \overline{GF} .



A. 5250 m^2

B. 3750 m^2

C. 3375 m^2

D. 3175 m^2

Answer: C



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17. The area of the base of a right equilateral triangular prism is $16\sqrt{3}cm^2$. If the height of the prism is 12 cm, then the lateral surface area and the total surface area of the prism respectively are

A. $288cm^2, (288 + 32\sqrt{3})cm^2$

B. $388cm^2, (388 + 32\sqrt{3})cm^2$

C. $288cm^2, (288 + 24\sqrt{3})cm^2$

D. $388cm^2, (388 + 24\sqrt{3})cm^2$

Answer: A



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18. A metallic cone of diameter 32 cm and height 9 cm is melted and made into identical spheres, each of radius 2 cm. How many such spheres can be made?

A. 72

B. 44

C. 52

D. 48

Answer: A



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19. A cylindrical vessel open at the top has a base radius of 28 cm. If the total cost of painting the outer part of the vessel is Rs. 357 at the rate of Rs. 0.2 per 100 cm^2 , then find the height of the vessel. (approximately)

A. 10 m

B. 9 m

C. 5 m

D. 4 m

Answer: A



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20. The radii of the ends of a bucket 16 cm high are 20 cm and 8 cm. Find the curved surface area of the bucket.

A. 1760 cm^2

B. 2240 cm^2

C. 880 cm^2

D. 3120 cm^2

Answer: A



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21. A cylindrical vessel of radius 8 cm contains water. A solid sphere of radius 6 cm is lowered into the water until it is completely immersed.

What is the rise in the water level in the vessel?

- A. 3 cm
- B. 3.5 cm
- C. 4 cm
- D. 4.5 cm

Answer: D



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22. What is the difference in the areas of the regular hexagon circumscribing a circle of radius 10 cm and the regular hexagon inscribed in the circle?

- A. 50cm^2
- B. $50\sqrt{3}\text{cm}^2$
- C. $100\sqrt{3}\text{cm}^2$

D. $100\sqrt{3}cm^2$

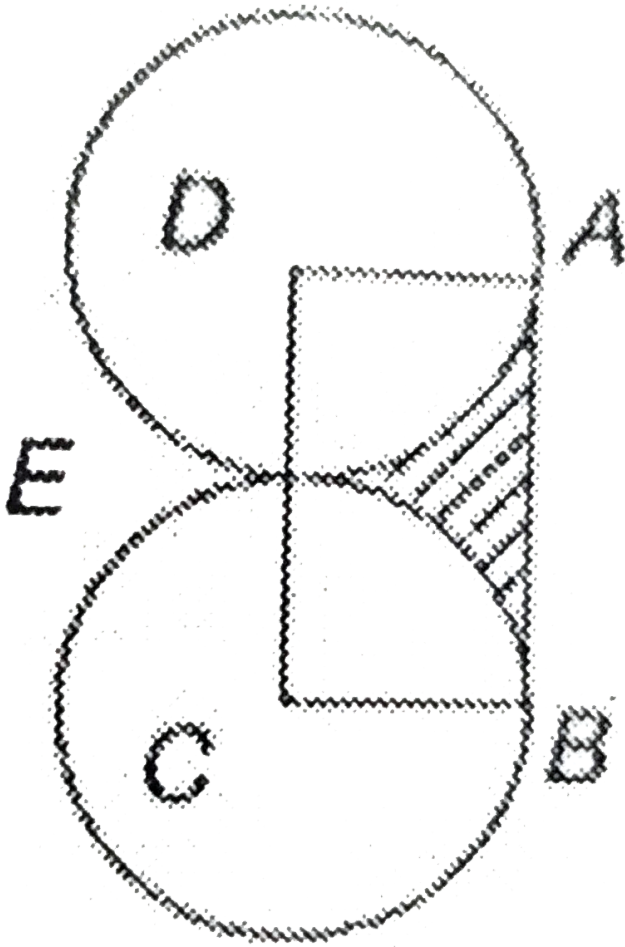
Answer: B



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23. In the shown figure, two circles of radii of 7 cm each, are shown. ABCD is rectangle and AD and BC are the radii. Find the area of the

shaded region (in cm^2).



A. 20

B. 21

C. 19

D. 18

Answer: B



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24. There is a closed rectangular shed of dimensions $10m \times 4m$ inside a field. A cow is tied at one corner of outside of the shed with a 6 m long rope. What is the area that the cow can graze in the field?

- A. $66 m^2$
- B. $88 m^2$
- C. $0.8\pi m^2$
- D. $27\pi m^2$

Answer: B



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25. The base of a right prism is a square of perimeter 20 cm and its height is 30 cm. What is the volume of the prism?

A. 700 cm^3

B. 750 cm^3

C. 800 cm^3

D. 850 cm^3

Answer: B



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26. A conical cup when filled with icecream forms a hemispherical shape on its open end. Find the volume of icecream (approximately), if radius of the base of the cone is 3.5 cm, the vertical height of cone is 7 cm and width of the cone is negligible.

A. 120 cm^3

B. 150 cm^3

C. 180 cm^3

D. 210 cm^3

Answer: C



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27. A hemispherical bowl of internal diameter 24 cm contains water. This water is to be filled in cylindrical bottles, each of radius 6 cm and height 8 cm. How many such bottles are required to empty the bowl?

A. 3

B. 4

C. 5

D. 6

Answer: B



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28. A dome of a building is in the form of a hemisphere. The total cost of white washing it from inside, was Rs. 1330.56. The rate at which it was white washed is Rs. 3 per square metre. Find the volume of the dome approximately.

A. 1150.53 m^3

B. 1050 m^3

C. 1241.9 m^3

D. 1500 m^3

Answer: C



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29. The area of a sector whose perimeter is four times its radius (r units) is

A. \sqrt{r} sq. units.

B. r^4 sq. units.

C. r^2 sq. units.

D. $\frac{r^2}{2}$ sq. units.

Answer: C



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30. A conical cup when filled with ice-cream forms a hemispherical shape on its open end. Find the volume of the ice-cream, if the radius of the base of the cone is 3.5 cm and the vertical height of the cone is 7 cm.

A. 120 cm^3

B. 150 cm^3

C. 180 cm^3

D. 210 cm^3

Answer: C



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Level 2

1. A circular garden of radius 15 m is surrounded by a circular path of width 7 m. If the path is to be covered with tiles at a rate of Rs. 10 per m^2 , then find the total cost of the work. (in Rs.)

A. 8410

B. 7140

C. 8140

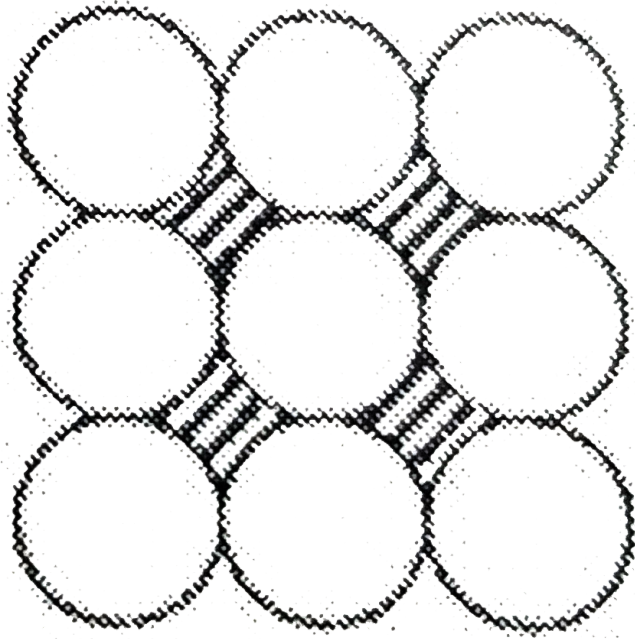
D. 7410

Answer: C



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2. Find the area of the shaded region, given that the radius of each circle is equal to 5 cm.



A. $(400 - 100\pi)cm^2$

B. $(360 - 100\pi)cm^2$

C. 231 cm^2

D. $(400 - 50\pi) \text{ cm}^2$

Answer: A



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3. The volume of a right prism, whose base is an equilateral triangle, is $1500\sqrt{3} \text{ cm}^3$ and the height of the prism is 125 cm. Find the side of the base of the prism.

A. $8\sqrt{3} \text{ cm}$

B. $4\sqrt{3} \text{ cm}$

C. $16\sqrt{3} \text{ cm}$

D. $24\sqrt{3} \text{ cm}$

Answer: B



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4. A right circular of volume 1386 cm^3 is cut from a right circular cylinder of radius 4 cm and height 49 cm, such that a hollow cylinder of uniform thickness, with a height of 49 cm and an outer radius of 4 cm is left behind. Find the thickness of the hollow cylinder left behind.

A. 0.5 cm

B. 2 cm

C. 1.5 cm

D. 1 cm

Answer: D



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5. The volume of a hemisphere is $18\pi \text{ cm}^3$. What is the total surface area of the hemisphere?

A. $18\pi cm^2$

B. $27\pi cm^2$

C. $21\pi cm^2$

D. $24\pi cm^2$

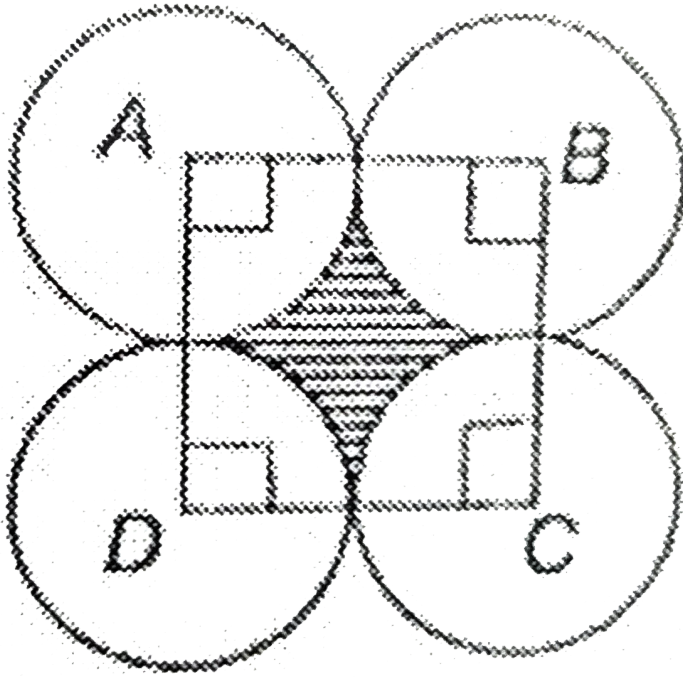
Answer: B



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6. The diagram shown above has four circles of 7 cm radius with centres at A, B, C and D. If the quadrilateral ABCD represents a square, then find

the area of the shaded region.



A. 42 cm^2

B. 21 cm^2

C. 63 cm^2

D. 84 cm^2

Answer: A



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7. Find the total surface area of a hollow metallic hemisphere whose internal radius is 14 cm and the thickness of the metal is 7 cm.

A. 4774 cm^2

B. 4477 cm^2

C. 4747 cm^2

D. 7744 cm^2

Answer: A



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8. A metal cube of edge $\frac{3}{10}$ m is melted and formed into three smaller cubes. If the edges of the two smaller cubes are $\frac{1}{5}$ m and $\frac{1}{4}$ m, find the edge of the third smaller cube.

A. $\frac{7}{20} \text{ m}$

B. $\frac{1}{20}m$

C. $\frac{3}{20}m$

D. None of these

Answer: C



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9. Two hemispherical vessels can hold 10.8 litres and 50 litres of liquid respectively. The ratio of their inner curved surface areas is _____.

A. 16 : 25

B. 25 : 9

C. 9 : 25

D. 4 : 3

Answer: C



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10. A cylindrical drum 1.5 m in diameter and 3 m in height is full of water. The water is emptied into another cylindrical tank in which water rises by 2 m. Find the diameter of the second cylinder up to 2 decimal places.

- A. 1.74 m
- B. 1.94 m
- C. 1.64 m
- D. 1.84 m

Answer: D



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11. Curved surface area of conical cup is $154\sqrt{2}cm^2$ and base radius is 7 cm. Find the angle at the vertex of the conical cup.

- A. 90°

B. 60°

C. 45°

D. 30°

Answer: A



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12. An equilateral triangle has a circle inscribed in it and is circumscribed by a circle. There is another equilateral triangle inscribed in the inner circle. Find the ratio of the areas of the outer circle and the inner equilateral triangle.

A. $\frac{16\pi}{3\sqrt{3}}$

B. $\frac{8\pi}{2\sqrt{3}}$

C. $\frac{24\pi}{3\sqrt{3}}$

D. None of these

Answer: A



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13. A triangle has sides of 48 cm, 14 cm and 50 cm. Find its circum-radius (in cm).

A. 25

B. 12.5

C. 20

D. 17.5

Answer: A



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14. The base of a pyramid is an n-sided regular polygon of area 360 cm^2 .

The total surface area of the pyramid is 900 cm^2 . Each lateral face of the

pyramid has an area of 30 cm^2 . Find n .

A. 20

B. 18

C. 16

D. 24

Answer: B



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15. In a right prism, the base is an equilateral triangle. Its volume is $80\sqrt{3}\text{cm}^3$ and its lateral surface area is 240 cm^2 . Find its height (in cm).

A. 10

B. 5

C. 15

D. 20

Answer: D



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16. A goat is tied to one corner of a field of dimensions $16\text{ m} \times 10\text{ m}$ with a rope 7 m long. Find the area of the field that the goat can graze.

The following are the steps involved in solving the above problem.

Arrange them in sequential order.

(A) Required area = 38.5 m^2

(B) Area of the field that the goat can graze = Area of the sector of radius 7 m and a sector angle of 90°

(C) $\frac{90^\circ}{360} \times \frac{22}{7} \times (7)^2$

A. ABC

B. BCA

C. BAC

D. CBA

Answer: B



Watch Video Solution

17. A right prism has a triangular base. If its perimeter is 24 cm and lateral surface area is 192 cm^2 , find its height.

The following are the steps involved in solving the above problem.

Arrange them in sequential order.

(A) $192 = 24 \times h$

(B) Given, LSA = 192 cm^2 , Perimeter of the base = 24 cm

(C) $h = 8 \text{ cm}$

(D) Lateral surface area of a prism = Perimeter of the base \times Height

A. BADC

B. BCAD

C. DABC

D. BDAC

Answer: D



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18. A metal cube of edge $\frac{3}{10}$ m is melted and formed into three smaller cubes. If the edges of the two smaller cubes are $\frac{1}{5}m$ and $\frac{1}{4}m$, find the edge of the third smaller cube.

A. $\frac{7}{20}m$

B. $\frac{1}{20}m$

C. $\frac{3}{20}m$

D. None of these

Answer: C



Watch Video Solution

19. An equilateral triangle has a circle inscribed in it and is circumscribed by a circle. There is another equilateral triangle inscribed in the inner circle. Find the ratio of the areas of the outer circle and the inner equilateral triangle.

A. $\frac{16\pi}{3\sqrt{3}}$

B. $\frac{8\pi}{2\sqrt{3}}$

C. $\frac{24\pi}{3\sqrt{3}}$

D. None of these

Answer: A



[Watch Video Solution](#)

20. A triangle has sides of 48 cm, 14 cm and 50 cm. Find its circum-radius (in cm).

A. 25

B. 12.5

C. 20

D. 17.5

Answer: A



[Watch Video Solution](#)

Level 3

1. An ink pen, with a cylindrical barrel of diameter 2 cm and height 10.5 cm, and completely filled with ink, can be used to write 4950 words. How many words can be written using 400 ml of ink ?

(Take 1 litre = 1000 cm^3)

A. 40000

B. 60000

C. 45000

D. 80000

Answer: B



[Watch Video Solution](#)

2. Each of height and side of the base of a regular hexagonal pyramid is equal to x cm. Find its lateral surface area in terms of x (in cm^2).

A. $\frac{9\sqrt{7}}{2}x^2$

B. $\frac{7\sqrt{7}}{2}x^2$

C. $\frac{5\sqrt{7}}{2}x^2$

D. $\frac{3\sqrt{7}}{2}x^2$

Answer: D



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3. The diameters of the top and the bottom portions of a bucket are 42 cm and 28 cm. If the height of the bucket is 24 cm, then find the cost of painting its outer surface at the rate of 5 paise/ cm^2 .

A. Rs. 158.25

B. Rs. 172.45

C. Rs. 168.30

D. Rs. 164.20

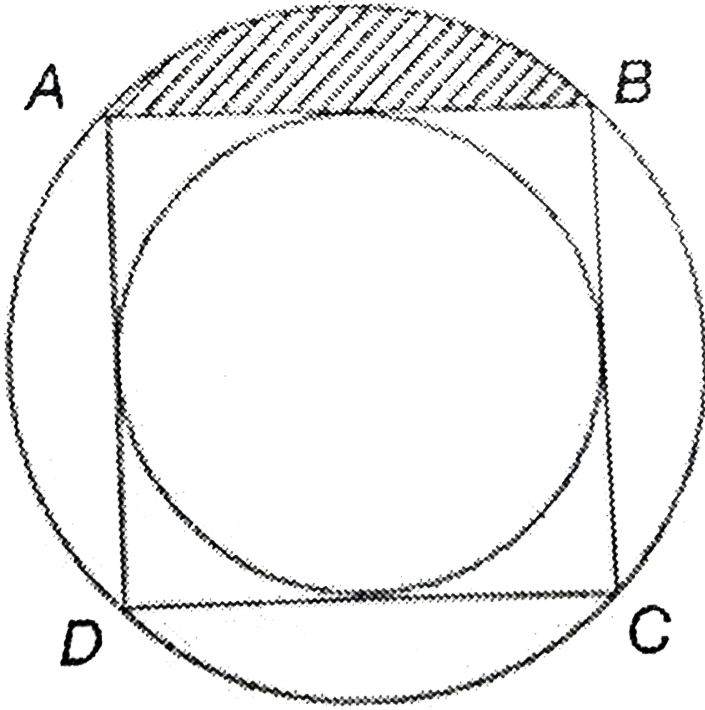
Answer: C



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4. In the following figure, a circle is inscribed in square ABCD and the square is circumscribed by a circle. If the radius of the smaller circle is r

cm, then find the area of the shaded region (in cm^2).



- A. $\left(\frac{\pi - 2}{4}\right)r^2$
- B. $\left(\frac{3\pi - 4}{2}\right)r^2$
- C. $\left(\frac{\pi + 2}{4}\right)r^2$
- D. $\left(\frac{\pi - 2}{2}\right)r^2$

Answer: D

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5. ABCD is a square of side 4 cm. If E is a point in the interior of the square such that $\triangle CED$ is equilateral, then find the area of $\triangle ACE$ (in cm^2).

A. $2(\sqrt{3} - 1)$

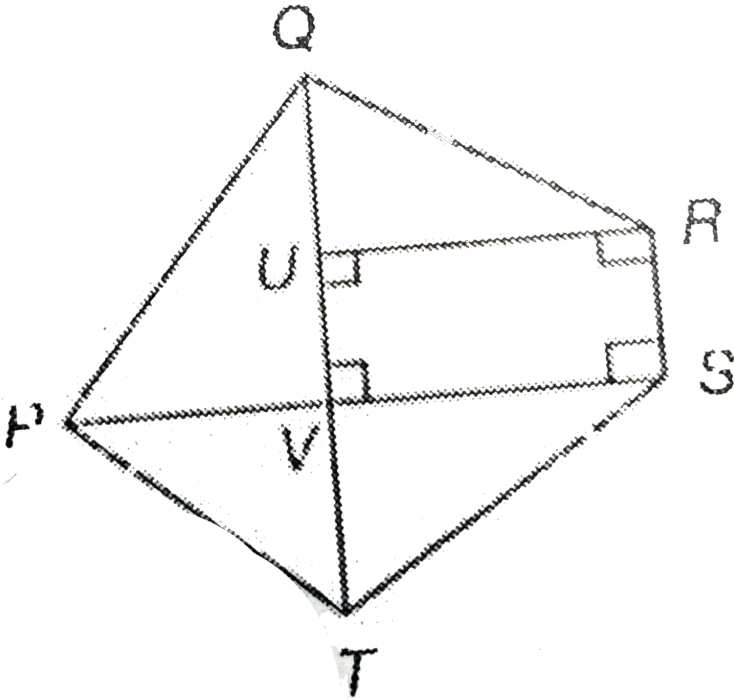
B. $4(\sqrt{3} - 1)$

C. $6(\sqrt{3} - 1)$

D. $8(\sqrt{3} - 1)$

Answer: B

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6. In the given figure (not to scale), $QT = 90m$ and $UR = 50m$. $QU:UT = UV:VT = 1:2$. $PV:VS = 4:5$. Find the area of the figure (in m^2)

- A. 4550
- B. 4200
- C. 4250
- D. 4100

Answer: A



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7. H_1 is a regular hexagon circumscribing a circle. H_2 is a regular hexagon inscribed in the circle. Find the ratio of areas of H_1 and H_2 .

A. 4 : 3

B. 2 : 1

C. 3 : 1

D. 3 : 2

Answer: A



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8. A dish, in the shape of a frustum of a cone, has a height of 6 cm. Its top and its bottom have radii of 24 cm and 16 cm respectively. Find its

curved surface area (in cm^2).

A. 240π

B. 400π

C. 180π

D. 160π

Answer: B



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9. Two circles touch each other externally. The sum of their area is $490\pi cm^2$. Their centres are separated by 28 cm. Find the difference of their radii (in cm).

A. 14

B. 7

C. 10.5

D. 3.5

Answer: A



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10. A closed rectangular shed has dimensions $21\text{ m} \times 14\text{ m}$. It is inside a field. A cow is tied outside the shed at one of its corners with a 21 m rope. Find the area over which the cow can graze (in m^2).

A. 342π

B. 294π

C. 343π

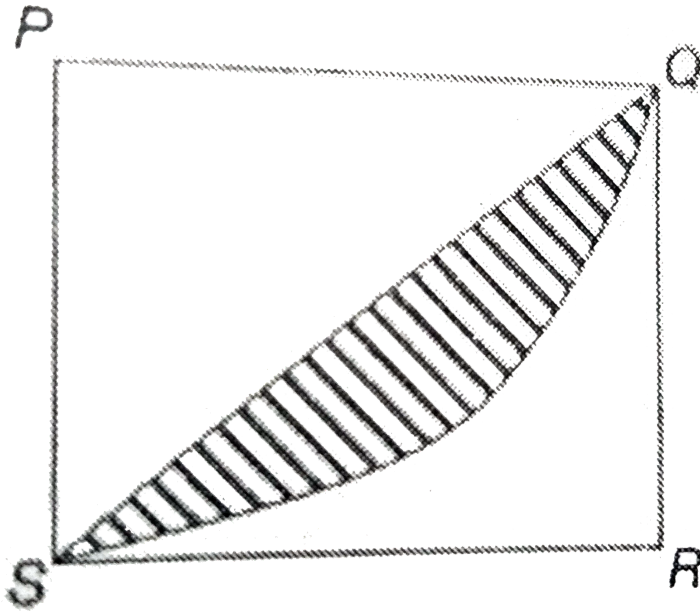
D. 441π

Answer: C



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11. In the given figure, PQRS is a square of diagonal $7\sqrt{2}$ cm. With P as the centre, the arc QS is drawn. Find the area of the shaded region (in cm^2).



- A. $\frac{49}{4}(\pi - 2)$
- B. $\frac{49}{4}(\pi - 1)$
- C. $\frac{49}{4}(\pi - 3)$
- D. $\frac{49}{2}(\pi - 2)$

Answer: A



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12. Three solid cubes have a face diagonal of $4\sqrt{2}$ cm each. Three other solid cubes have a face diagonal of $8\sqrt{2}$ cm each. All the cubes are melted together to form a cube. Find the side of the cube formed in cm).

A. $\sqrt[3]{324}$

B. $\sqrt[3]{576}$

C. 12

D. 24

Answer: C



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13. The outer radius and the inner radius of a 30 cm long cylindrical gold pipe are 14 cm and 7 cm respectively. It is filled with bronze. The densities of gold and bronze are 20gm/cm^3 and 30gm/cm^3 respectively. Find the weight of the cylinder formed. (in gm)

A. 66150π

B. 99225π

C. 132300π

D. 198450π

Answer: C



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14. A rectangular sump has an inner length and breadth of 24 m and 20 m respectively. Water flows through an inlet pipe at 180 m per minute. The cross-sectional area of the pipe is 0.5 m^2 . The tank takes half an hour to get filled. Find the depth of the sump (in m).

A. 4.625

B. 6.125

C. 5.625

D. 5.125

Answer: C



[Watch Video Solution](#)

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Watch Video Solution

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B. $\frac{7\sqrt{7}}{2}x^2$

C. $\frac{5\sqrt{7}}{2}x^2$

D. $\frac{3\sqrt{7}}{2}x^2$

Answer: D



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[Watch Video Solution](#)

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[Watch Video Solution](#)

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B. 7

C. 10.5

D. 3.5

Answer: A



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