MATHS

BOOKS - MTG IIT JEE FOUNDATION

MENSURATION

Illustrations

1. The area of a square is 42.25 m^2:

Find the side of the square.

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2. The area of a square is 42.25 m^2:

If the tiles measuring 13 cm $\times$ 13 cm are paved on the square area, find how many tiles are used for paving it?

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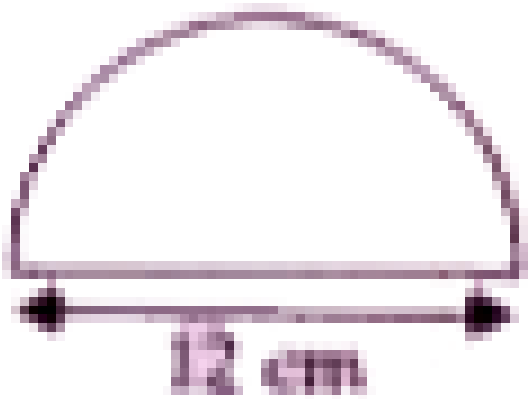
3. Find the area of the given figure.



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4. A 5100 sq. cm trapezium has the perpendicular distance between the two parallel sides is 60 cm.

If one of the parallel sides be 40 cm then, find the length of the other parallel side.

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5. The area of the trapezium is 105 cm^2 and its height is 7 cm. If one of the parallel sides is longer than the other by 6 cm, find the length of parallel sides.

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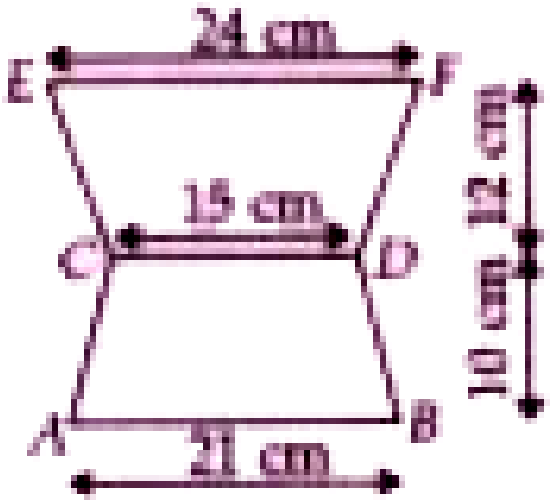
6. Find the area of the given figure.



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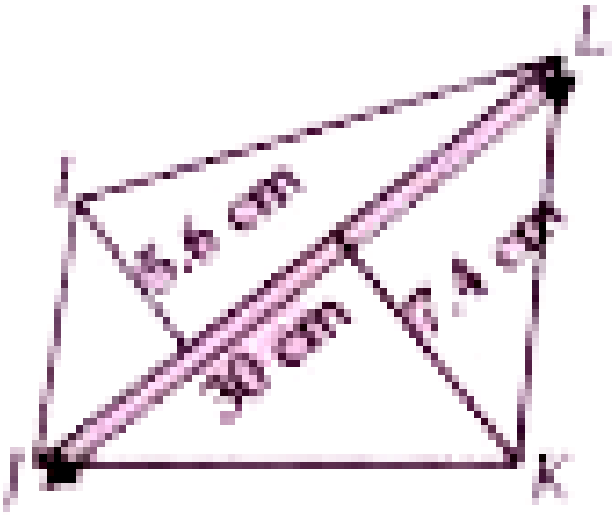
7. Find the area of quadrilateral IJKL.



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8. The length of a side of a square field is 4 m. What will be the altitude of the rhombus, if the area of the rhombus is equal to the area

of a square field and one of its diagonal is 2 m

?

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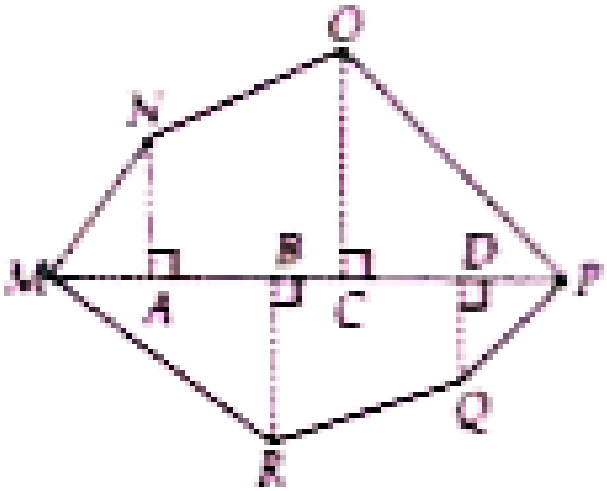
9. Find the area of the hexagon in the adjoining figure, if $MP = 9cm$,

$MD = 7 \text{ cm}, MC = 6\text{cm},$

$MB = 4 \text{ cm}, MA = 2 \text{ cm},$

$AN = 3 \text{ cm}, OC = 5 \text{ cm},$

$DQ = 2$ cm and $BR = 4$ cm.



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10. Find the surface area of a chalk box, whose length, breadth and height are 16 cm, 4 cm and 6 cm respectively.

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11. A swimming pool is $20m$ in length, $15m$ in breadth, and $4m$ in depth. Find the cost of cementing its floor and walls at the rate of $Rs\dot{1}2$ per square metre.

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12. The diameter of a garden roller is 1.4 m and it is 2 m long. How much area will it cover in 5

revolutions? (a) 36 m2 (b) 40 m2 (c) 44 m2 (d) 48 m2

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13. The ratio between the curved surface area and the total surface area of a right circular cylinder is 1:2. Find the ratio between the height and radius of the cylinder.

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14. A rectangular sheat of paper $44cm\ x\ 18cm$ is rolled along its length and a cylinder is formed. Find the radius of the cylinder.

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15. Find the surface area of a cube whose volume is $512m^3$

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16. A rectangular block of ice measures 40cm by 25cm by 15cm. Calculate its weight in kg, if ice weighs $\frac{9}{10}$ of the weight of the same volume of water and $1\ cm^3$ of water weighs 1 gm.

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17. The length of a cold storage is double its breadth. Its height is $3\ metres$. The area of its

four walls (including doors) is $108\ m^2$. Find its volume.

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18. An agricultural field is in the form of a rectangle of length $20m$ and width $14m$. A pit $6mlong, 3mwideand2.5mdeep$ is dug in a corner of the field and the earth taken out of the pit is spread uniformly over the remaining area of the field. Find the extent to which the level of the field has been raised.

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19. The dimensions of a rectangular box are int he ratio of $2:3:4$ and the difference between the cost of covering it with sheet of paper at the rates of $Rs.8$ and $Rs.9.50 per m^2$ is $Rs.1248$. Find the dimensions of the box.

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20. A rectangular paper of width 14 cm is rolled along its length and a cylinder of radius

20 cm is formed. Find the volume of the cylinder. $\left(\text{Take}\pi = \frac{22}{7}\right)$

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21. The volume of a solid cylinder is $448\,\pi cm^3$ and height 7cm. Find its lateral surface area and total surface area.

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22. Find the number of coins, 1.5 cm in diameter and 0.2 cm thick, to be melted to form a right circular cylinder of height 10 cm and diameter 4.5 cm.

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Solved Examples

1. The length of a rectangle is increased by 60%. By what percent should the width be

decreased to maintain the same area?

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2. The diagonal of the floor of a rectangular closet is $7\frac{1}{2}$ feet. The shorter side of the closet is $4\frac{1}{2}$ feet. What is the area of the closet in square feet? $5\frac{1}{4}$ (b) $13\frac{1}{2}$ (c) 27 (d) 37

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3. A hall-room 39 m 10 cm long and 35 m 70 cm broad is to be paved with equal square tiles. Find the largest tile so that the tiles exactly fit and also find the number of tiles required.

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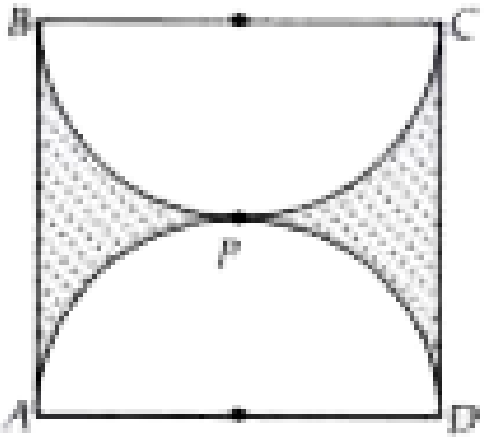
4. Find the area of the shaded region of the given figure, if ABCD is a square of side 14 cm and APD and BPC are semi-circles.

$\left(\text{Take} \pi = \frac{22}{7} \right)$



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5. An athletic track 14 m wide consists of two straight sections 120 m long joining semi-circular ends whose inner radius is 35 m.

Calculate the area of the shaded region. $\left(\text{Take} \pi = \frac{22}{7} \right)$

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6. In the adjoining figure, $AB \| DC$ and DA is perpendicular to AB. Further, $DC = 7$ cm, $CB = 10$ cm and $AB = 13$ cm. Find the area of the quadrilateral ABCD.

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7. Find the area of the four walls of the room whose length is 6 m, breadth is 5 m and height is 4 m. Also find the cost of white washing of four walls, if the rate of white washing is Rs. 5 per square metre.

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8. The edge of cube is 20 cm. How many smallcubes of 5 cm edge can be formed from this cube ?

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9. How many bricks of size $22cm\ x\ 10cm\ x\ 7cm$ are required to construct a wall 33m long, 3.5m high and 40cm thick, if cement and sand used in the construction occupy $\frac{1}{10}th$ part of the wall?

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10. A cuboidal oil tin is $30\ cm$ by $40\ cm$ by $50\ cm$. Find the cost of the tin required for

making 20 such tines if the cost of tin sheet is $Rs.20$ per square metre.

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11. The paint in a certain container is sufficient to paint on area equal to $9.375\ m^2$. How many bricks of dimension $22.5\ cm\ x\ 10\ cm\ x\ 7.5\ cm$ can be painted out of this container?

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12. A cub of $9\ cm$ edge is immersed completely in a rectangular vessel containing water. If the dimensions of the base are $15cm\ and\ 12cm$. Find the rise in water level in the vessel.

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13. How many soap cakes can be placed in a box of size $56cm\ x\ 0.\ 4m\ x\ 0.\ 25m,$ if the size of a soap cake is $7cm\ x\ 5cm\ x\ 2.\ 5cm$?

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14. If V is the volume of a cuboid of dimensions $a,\ b,\ c\ and\ S$ is its surface area, then prove that $\frac{1}{V} = \frac{2}{S}\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)$

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15. In a temple there are 25 cylindrical pillars. The radius of each pillar is 28 cm and height is 4 m. Find the total cost of painting the curved surface area of pillars at the rate of Rs. 8 per m^2. $\left[\text{Take}\pi = \frac{22}{7}\right]$

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16. A company packages its milk powder in cylindrical containers whose base has a diameter of 16.8 cm and height 20.5 cm. Company places a label around the curved surface of the container. If the label is placed 1.5 cm from the top and the bottom, what is the surface area of the label? $\left[\text{Take}\pi = \frac{22}{7}\right]$

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17. The radii of two right circular cylinders are in the ratio 2 : 3 and their heights are in the ratio 5 : 4. Calculate the ratio of their curved surface areas and also the ratio of their volumes.

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18. A circular well of radius 3.5 m is dug 20 m deep and the earth so dug is spread on a rectangular plot of length 14 m and breadth 11

m. Find :

Volume of the earth dug-out.

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19. A circular well of radius 3.5 m is dug 20 m deep and the earth so dug is spread on a rectangular plot of length 14 m and breadth 11 m. Find :

Height of the platform formed by spreading the earth on the rectangular plot.

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20. The thickness of a metallic tube is 1 cm and its outer radius is 11 cm. Find the mass of such 1 metre a long tube, if the density of the metal is 7.5 g per cm^3. $\left[\text{Take}\pi = \frac{22}{7}\right]$

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21. A rectangular sheet of paper is rolled in two different ways to form two different cylinders.Find the volume of the cylinders in each case if the sheet measured 44cmX33cm

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Ncert Section Exercise 11 1

1. A square and a rectangular field with measurements as given in the figure have the same perimeter. Which field has a larger area?

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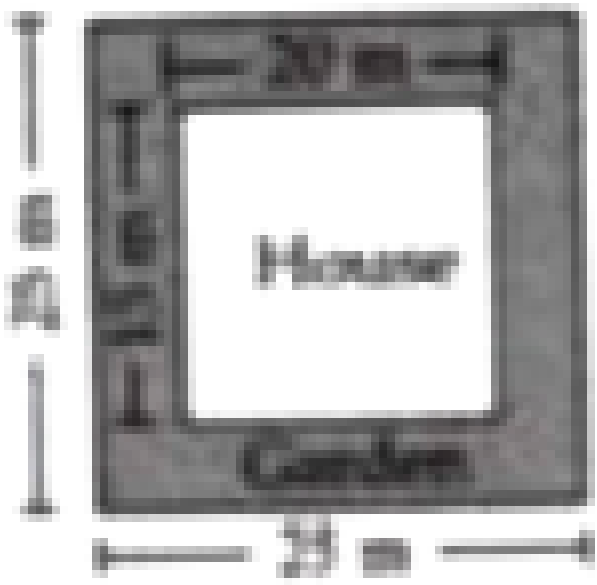
2. Mrs. Kaushik has a square plot with the measurement as shown in figure. She wants to construct a house in the middle of the plot. A garden is developed around the house. Find the total cost of developing a garden around the house at the rate of Rs. 55 per m^2.



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3. The shape of a garden is rectangular in the middle and semi circular at the ends as shown in the diagram. Find the area and the perimeter of this garden (Length of rectangle is $20 - (3.5 + 3.5)$ metres).

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4. A flooring tile has the shape of a parallelogram whose base is 24 cm and the corresponding height is 10 cm. How many such tiles are required to cover a floor of area 1080 m2? (If required you can split the tiles in whatever way you want to fill u

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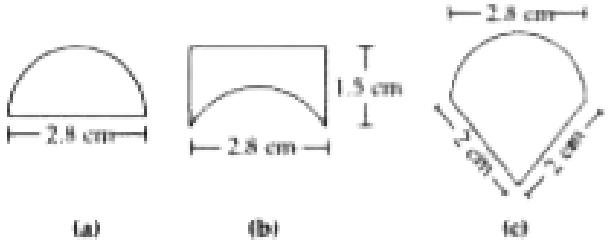
5. An ant is moving around a few food pieces of different shapes scattered on the floor. For

which food-piece would the ant have to take a longer round ? Remember, circumference of a circle can be obtained by using the expression $c = 2\pi r$, where r is the radius of the circle.



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Ncert Section Exercise 11 2

1. The shape of the top surface of a table is a trapezium. Find its area if its parallel sides are 1 m and 1.2 m and perpendicular distance between them is 0.8 m.

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2. The area of a trapezium is 34 cm^2 and the length of one of the parallel sides is 10 cm and its height is 4 cm. Find the length of the other parallel side.

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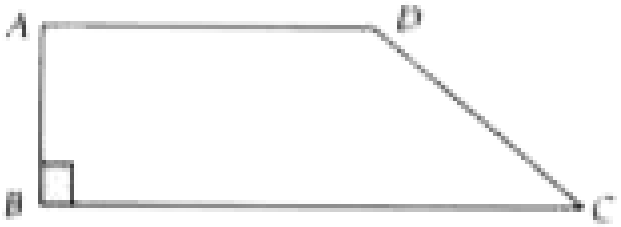
3. Length of the fence of a trapezium shaped field ABCD is 120 m. If $BC = 48$ m, $CD = 17$ m and $AD = 40$ m, find the area of this field. Side AB is perpendicular to the parallel sides AD and BC.



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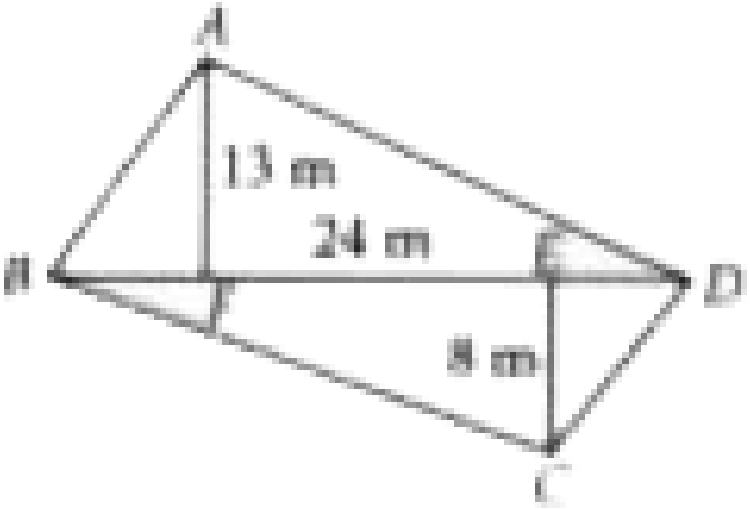
4. The diagonal of a quadrilateral shaped field is 24 m and the perpendiculars dropped on it from the remaining opposite vertices are 8 m and 13 m. Find the area of the field.



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5. The diagonals of a rhombus are 7.5 cm and 12 cm. Find its area.

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6. Find the area of a rhombus whose side is 6 cm and whose altitude is 4 cm. If one of its diagonals is 8 cm long, find the length of the other diagonal.

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7. The floor of a building consists of 3000 tiles which are rhombus shaped and each of its diagonals are 45 cm and 30 cm in length. Find the total cost of polishing the floor, if the cost per m^2 is Rs. 4.

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8. Mohan wants to buy a trapezium shaped field. Its side along the river is parallel to and twice the side along the road. If the area of this field is 10500 m2 and the perpendicular

distance between the two parallel sides is 100 m, find the length

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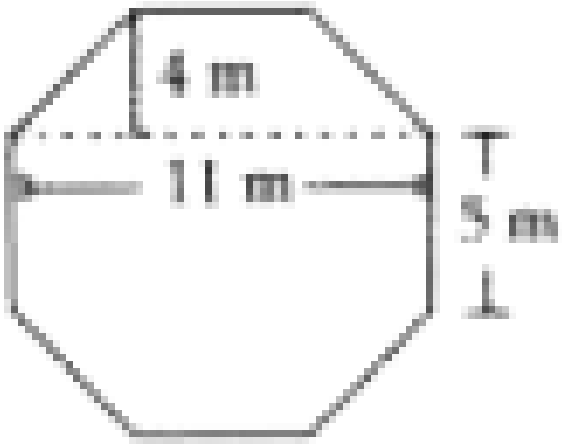
9. Top surface of a raised platform is in the shape of a regular octagon as shown in the figure. Find the area of the octagonal surface.



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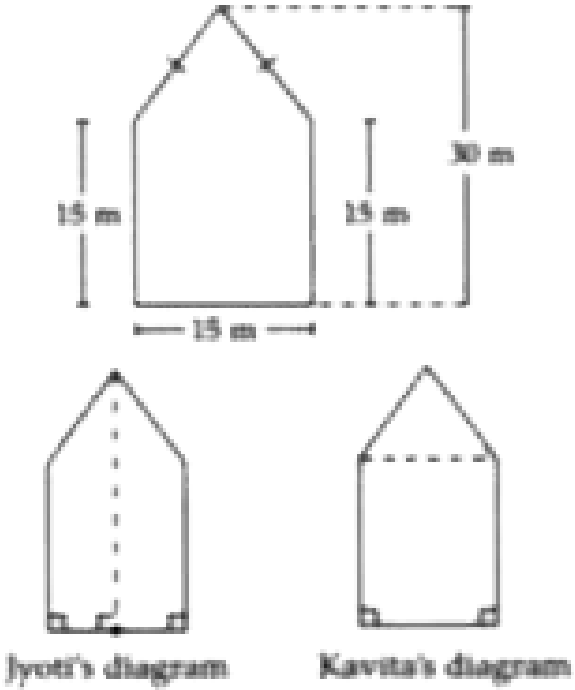
10. There is a pentagonal shaped park as shown in the figure. For finding its area Jyoti and Kavita divided it in two different ways. Find the area of this park using both ways. Can you suggest some other way of finding its area

?



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11. Diagram of the adjacent picture frame has outer dimensions

= 24{\rm{ }}cm{\rm{ }} \times {\rm{ }}28{\rm{ }}cm

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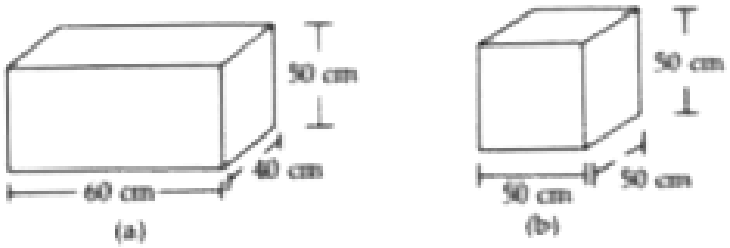
Ncert Section Exercise 11 3

1. There are two cuboidal boxes as shown in the adjoining figure. Which box requires the lesser

amount of material to make ?



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2. A suitcase with measures 80 cm $\times$ 48 cm $\times$ 24 cm is to be covered with a trapaulin cloth. How many metres of trapaulin of width 96 cm is required to cover 100 such suitcases ?

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3. Find the side of a cube whose surface area is 600 cm^2.

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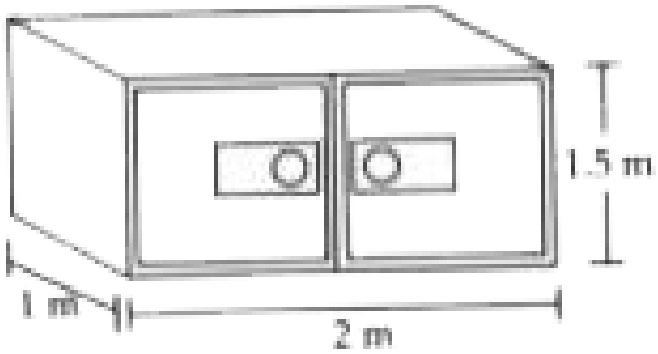
4. Rukhsar painted the outside of the cabinet of measure 1 m $\times$ 2 m $\times$ 1.5 m. How much surface area did she cover if she painted all except the

bottom of the cabinet?



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5. Daniel is painting the walls and ceiling of a cuboidal hall with length, breadth and height of 15 m, 10 m and 7 m respectively. From each can of paint 100 {m^2}

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6. Describe how the two figures at the right are alike and how they are different. Which box has larger lateral surface area?

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7. A closed cylindrical tank of radius 7 m and height 3 m is made from a sheet of metal. How much sheet of metal is required ?

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8. The lateral surface area of a hollow cylinder is 4224 cm^2. It is cut along its height and formed a rectangular sheet of width 33 cm. Find the perimeter of rectangular sheet.

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9. A road roller takes 750 complete revolutions to move once over to level a road. Find the area of the road if the diameter of a road roller is 84 cm and length is 1 m.

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10. A company packages its milk powder in cylindrical container whose base has a diameter of 14 cm and height 20 cm. Company places a label around the surface of the container (as shown in figure). If the label is placed 2 cm from

top and bottom, what is the area of the label?

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Ncert Section Exercise 11 4

1. Given a cylindrical tank, in which situation will you find surface area and in which situation volume.

To find how much it can hold.

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2. Given a cylindrical tank, in which situation will you find surface area and in which situation volume.

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3. Diameter of cylinder A is 7 cm, and the height is 14 cm. Diameter of cylinder B is 14 cm and height is 7 cm. Without doing any calculations can you suggest whose volume is greater? Verify it by finding the volume of both the cylinders. Check whet

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4. Find the height of a cuboid whose base area is 180

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5. A cuboid is of dimensions  $60{\rm{ }}cm{\rm{ }} \times {\rm{ }}54{\rm{ }}cm{\rm{ }} \times {\rm{ }}30{\rm{ }}cm$

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6. Find the height of the cylinder whose volume is 1.54

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7. A milk tank is in the form of cylinder whose radius is 1.5 m and length is 7 m. Find the quantity of milk in litres that can be stored n the tank?

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8. If each edge of a cube is doubled,

how many times will its surface area increase?

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9. If each edge of a cube is doubled,

how many times will its volume increase?

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10. Water is pouring into a cubiodal reservoir at the rate of 60 litres per minute. If the volume of reservoir is 108 {m^3}

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Exercise Multiple Choice Questions Level 1

1. The maximum length of a pencil that can be kept in a rectangula box of dimensions $12cm \times 9cm \times 8cm$ is

A. 13 cm

B. 17 cm

C. 18 cm

D. 19 cm

Answer: B

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2. The surface area of a cube is 1734 sq. cm. Find its volume.

A. 2197 cm^3

B. 4913 cm^3

C. 2744 cm^3

D. 4096 cm^3

Answer: B

3. The volume of a cube is $2744cm^3$. Its surface area is

A. 196 cm^2

B. 588 cm^2

C. 784 cm^2

D. 1176 cm^2

Answer: D

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4. How many cubes of 10 cm edge can be put in a cubical box of 1 m edge?

A. 10

B. 100

C. 1000

D. 7200

Answer: C

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5. A metallic sheet is a rectangular shape with dimensions 48 m $\times$ 36 m. From each of its corners, a square is cut off so as to make an

open box. If the length of each square is 8 m, then the volume of the box is

A. 4830 m^3

B. 5120m^3

C. 6420 m^3

D. 8960 m^3

Answer: B

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6. Two cubes have their volumes in the ratio 1 : 27 . The ratio of their surface areas is

A. $1:3$

B. $1:9$

C. $1:27$

D. none of these

Answer: B

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7. Three cubes of iron whose edges are 6 cm, 8 cm and 10 cm respectively are melted and formed into a single cube. The edge of the new cube formed is

A. 12 cm

B. 14 cm

C. 16 cm

D. 18 cm

Answer: A

8. Five equal cubes, each of side 5 cm, are placed adjacent to each other. The volume of the new solid formed will be (a) 125 cm3 (b) 625 cm3 (c) 15525 cm3 (d) None of these

A. 125 cm^3

B. 375 cm^3

C. 525 cm^3

D. 625 cm^3

Answer: D

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9. A circular well with a diameter of 2 metres, is dug to a depth of 14 metres. What is the volume of the earth dug out? (a) 32 m3 (b) 36 m3 (c) 40 m3 (d) 44 m3

A. 32 m^3

B. 36 m^3

C. 40 m^3

D. 44 m^3

Answer: D

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10. If the capacity of a cylindrical tank is $1848m^3$ and the diameter of its base is 14 m, the depth of the tank is

A. 8 m

B. 12 m

C. 16 m

D. 18 m

Answer: B

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11. The ratio of the radius and height of a cylinder is 2:3. If its volume is 12,936 cm^3, find the total surface area of the cylinder.

A. 3080 cm^2

B. $3480cm^2$

C. $4260cm^2$

D. $4860cm^2$

Answer: A

12. The number of coins, each of radius 0.75 cm and thickness 0.2 cm, to be melted to make a right circular cylinder of height 8 cm and base radius 3 cm is

A. 460

B. 500

C. 600

D. 640

Answer: D

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13. The length of a room is 5.5 m and width is 3.75 m. Find the cost of paving the floor by slabs at the rate of Rs 800 per sq. metre. (a) Rs 15,000 (b) Rs 15,550 (c) Rs 15,600 (d) Rs 16,500

A. Rs. 15000

B. Rs. 15550

C. Rs. 15600

D. Rs. 16500

Answer: D

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14. The length of a rectangle is 18 cm and its breadth is 10 cm. When the length is increased to 25 cm, what will be the breadth of the

rectangle if the area remains the same? (a) 7 cm

(b) 7.1 cm (c) 7.2 cm (d) 7.3 cm

A. 7 cm

B. 7.1 cm

C. 7.2 cm

D. 7.3 cm

Answer: C

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15. A rectangular plot measuring 90 metres by 50 metres is to be enclosed by wire fencing. If the poles of the fence are kept 5 metres apart, how many poles will be needed? (a) 55 (b) 56 (c) 57 (d) 58

A. 55

B. 56

C. 57

D. 58

Answer: B

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16. The length of a rectangular plot is 60% more than its breadth. If the difference between the length and the breadth of that rectangle is 24 cm, what is the area of that rectangle? (a) 2400 sq. cm (b) 2480 sq. cm (c) 2560 sq. cm (d) Data inadequate (e) None of these

A. 2400 sq. cm

B. 2480 sq. cm

C. 2560 sq. cm

D. Data inadequate

Answer: C

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17. A rectangular parking space is marked out by painting three of its sides. If the length of the unpainted side is 9 feet, and the sum of the lengths of the painted sides is 37 feet, then what is the area of the parking space in square feet?

(a) 46 (b) 81 (c) 126 (d) 252

A. 46

B. 81

C. 126

D. 252

Answer: C

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18. The difference between the length and breadth of a rectangle is 23 m. If its perimeter is 206 m, then its area is

A. 1520 m^2

B. 2420 m^2

C. 2480 m^2

D. $2520m^2$

Answer: D

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19. The length of a rectangular plot is 20 metres more than its breadth. If the cost of fencing the plot @ Rs 26.50 per metre is Rs 5300, what is the

length of the plot in metres? (a) 40 (b) 50 (c) 120

(d) Data inadequate (e) None of these

A. 40

B. 50

C. 120

D. none of these

Answer: D

20. The capacity of a tank of dimensions (8 m $\times$ 6 m $\times$ 2.5 m) is

A. 120 litres

B. 1200 litres

C. 12000 litres

D. 120000 litres

Answer: D

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21. Find the surface area of a 10 cm $\times$ 4 cm $\times$ 3 cm brick.

A. 84 sq. cm

B. 124 sq. cm

C. 164 sq. cm

D. 180 sq. cm

Answer: B

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22. Find the surface area of a cuboid 16 m long, 14 m broad and 7 m high.

A. 1568 m^3

B. 868 m^2

C. 6815 m^3

D. 688 m^2

Answer: B

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23. The diagonal of a cube is $6\sqrt{3}$ cm. Find its volume.

A. 612 cm^3

B. 216 cm^3

C. 226 cm^3

D. 136 cm^3

Answer: B

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24. Find the total surface area of a cylinder with diameter of base 7 cm and height 40 cm.

A. 1540 cm^2

B. 880 cm^2

C. 957 cm^2

D. 415 cm^2

Answer: C

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25. The edges of a cuboid are in the ratio $1:2:3$ and its surface area is 88 cm^2. Find the length, breadth and height respectively of cuboid.

A. 2, 4 and 6

B. 4, 8 and 2

C. 6, 4 and 2

D. 8, 2 and 6

Answer: A

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26. The side of a cube is halved. By what percent will its surface area decrease ?

A. 0.5

B. 0.75

C. 0.25

D. Surface area remains same

Answer: B

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27. An open cylindrical tank is of radius 2.8 m and height 3.5 m. What is the capacity of the tank?

A. 96.24 m^3

B. 84.26 m^3

C. 86.24 m^3

D. 82.64 m^3

Answer: C

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28. The length of the longest rod that can be put in a box of dimensions 10 cm by 10 cm by 5 cm is

A. 8 cm

B. 9 cm

C. 12 cm

D. 15 cm

Answer: D

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29. What is the area of the region of the circle which is situated outside the incribed square of side x ?

A. $(\pi - 2)x^2$

B. $(\pi - 2)x^2/2$

C. $2(\pi - 2)x^2$

D. $(\pi - 2)x^2/4$

Answer: B

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30. It is required to fix a pipe such that water flowing through it at a speed of 7 metres per minute fills a tank of capacity 440 cubic metres in 10 minutes. The inner radius of the pipe should be $\sqrt{2}\,m$ (b) $2\,m$ (c) $\frac{1}{2}m$ (d) $\frac{1}{\sqrt{2}}m$

A. $\sqrt{2}$ m

B. 2m

C. $\frac{1}{2}$ m

D. $\frac{1}{\sqrt{2}}$ m

Answer: A

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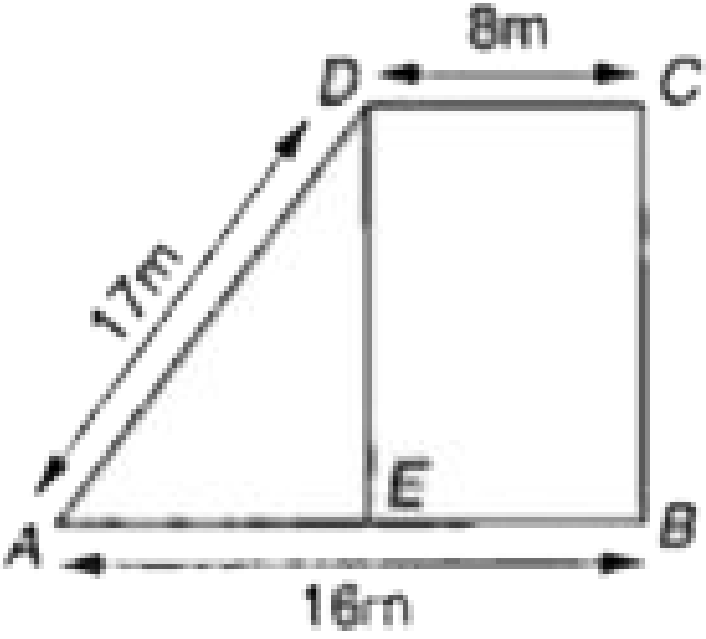
31. In the given figure , ABCD is a trapezium in which the parallel sides AB,CD are both perpendicular to BC. Find the area of the trapezium :



A. 140 m^2

B. 168 m^2

C. 180 m^2

D. 156.4 m^2

Answer: C

Watch Video Solution

32. The height of the hall is 13 m and the perimeter of its floor is 430 m. Find the area of four walls of the hall.

A. 9590 m^2

B. 5590 m^2

C. 9055 m^2

D. 5059 m^2

Answer: B

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33. A cuboidal vessel is 22 meter long and 10 meter wide. How high must it be made to hold 440 cubic meter of water?

A. 4 meter

B. 2 meter

C. 8 meter

D. 6 meter

Answer: B

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34. What is the formula for finding the surface area of an open cylinder with radius of base 'r' and height 'h'?

A. $2\pi rh$

B. $\pi r^2 h$

C. $\pi r(2h + r)$

D. $2\pi r(h + r)$

Answer: C

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35. The area of a rhombus is 840 cm^2 and one of its diagonals is 14 cm, find the other diagonal.

A. 100 cm

B. 140 cm

C. 120 cm

D. 210 cm

Answer: C

Watch Video Solution

Exercise Multiple Choice Questions Level 2

1. The cost of painting the whole surface area of a cube at the rate of 13 paise per sq. cm is Rs 343.98. Then the volume of the cube is: (a) 8500 cm3 (b) 9000 cm3 (c) 9250 cm3 (d) 9261 cm3

A. 6859 cm^3

B. 8000 cm^3

C. 9.261 cm^3

D. 10.648 cm^3

Answer: C

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2. How many bricks, each measuring 25 cm $\times$ 11.25 cm $\times$ 6 cm will be needed to build a wall 8 m long, 6 m high and 22.5 cm thick?

A. 5600

B. 6000

C. 6400

D. 7200

Answer: C

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3. The dimensions of a piece of iron in the shape of a cuboid are $270cm \times 100cm \times 64cm$. If it is melted and recast into a cube, then the surface area of the cube will be (a) 14400 cm2 (b) 44200 cm2 (c) 57600 cm2 (d) 86400 cm2

A. 14400 cm^2

B. 44200 cm^2

C. 57600 cm^2

D. 86400 cm^2

Answer: D

Watch Video Solution

4. The ratio of the total surface area to the lateral surface area of a cylinder whose radius is 20 cm and height 60 cm, is

A. $2:1$

B. $3:2$

C. $4:3$

D. $5:3$

Answer: C

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5. 66 cubic centimetres of silver is drawn into a wire 1 mm in diameter. The length of the wire in metres will be (a) 84 (b) 90 (c) 168 (d) 336

A. 78

B. 84

C. 96

D. 108

Answer: B

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6. A closed box is varnished on the outside at the rate of 5 paise per cm^2. What is the total cost of varnishing a box of length 50 cm, breadth 40 cm and height 30 cm?

Watch Video Solution

7. If the diameter of base of a right circular cylinder is decreased by 10%, then volume of cylinder remains the same. Find the percentage increase in height.

A. 0.2

B. 0.2345

C. 0.15

D. 0.2054

Answer: B

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Watch Video Solution

8. If the area of three adjoining faces of a cuboid are a^2, b^2 and c^2 respectively, then the volume of the cuboid is

A. $a^2b^2c^2$

B. abc

C. $a^3b^3c^3$

D. $\sqrt{abc}$

Answer: B

Watch Video Solution

9. The difference between the area of a square and that of an equilateral triangle on the same base is 1/4 cm^2. What is the length of side of triangle ?

A. $\left(4-\sqrt{3}\right)^{1/2}$ cm

B. $\left(4+\sqrt{3}\right)^{1/2}$ cm

C. $\left(4-\sqrt{3}\right)^{-1/2}$ cm

D. $\left(4+\sqrt{3}\right)^{-1/2}$ cm

Answer: C

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10. The measure of each of the two opposite angles of a rhombus is 60° and the measure of one of its sides is 10 cm. The length of its smaller diagonal is

A. 10 cm

B. $10\sqrt{3}$ cm

C. $10\sqrt{2}$ cm

D. $\frac{5}{2}\sqrt{2}$ cm

Answer: A

Watch Video Solution

11. Anjali has 0.88 cubic metres of iron. Find the number of cylindrical iron rods, each of length 14 m and diameter 2 cm, she can make.

A. 150

B. 200

C. 250

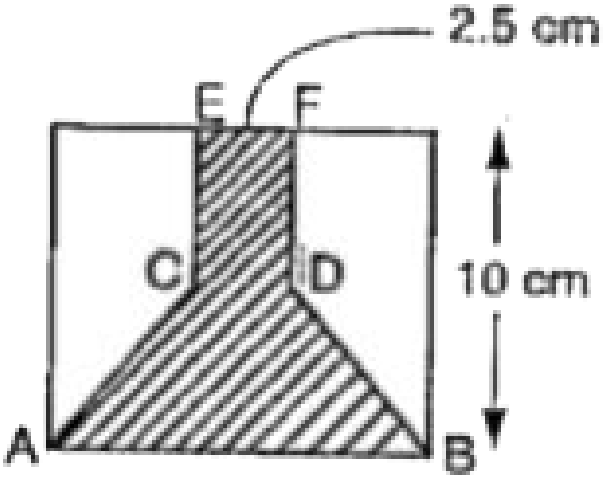
D. 400

Answer: B

Watch Video Solution

12. In the given figure, the side of the square is 10 cm. EF = 2.5 cm and C and D are half way between the top and bottom sides of the figure. The area

of the shaded portion of the figure is



A. 43.75 cm^2

B. $56.25cm^2$

C. $55.25cm^2$

D. $50.\ 25cm^2$

Answer: A

Watch Video Solution

13. The perimeter of a rhombus is 146 cm and one of its diagonal is 55 cm. Find the other diagonal and the area of the rhombus.

A. 24 cm, 660 cm^2

B. 24 cm, 330 cm^2

C. 48 cm , 660 cm^2

D. 48 cm, 1320 cm^2

Answer: D

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14. The circumference of the base of a circular cylinder is 8π cm. The height of the cylinder is same as the diameter of the base. How much water can the cylinder hold?

A. 128π litres

B. 0.128π litres

C. 630π litres

D. 0.164π litres

Answer: B

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15. If the perimeter of a rhombus is $4a$ and the length of the diagonals are x and y, then its area is

A. $a(x+y)$

B. x^2+y^2

C. xy

D. $\frac{1}{2}xy$

Answer: D

Watch Video Solution

Exercise Match The Following

1. In this section, each question has two matching lists. Choices for the correct combination of elements from List-I and List-II are given as options (a), (b), (c) and (d) out of which one is correct.

Match the following lists:

List-I		List-II	
(P)	The perimeter of a rhombus is	(1)	$\frac{\sqrt{3}}{2}$ (side)
(Q)	The circumference of a circle is	(2)	$2\sqrt{d_1^2 + d_2^2}$
(R)	The altitude of an equilateral triangle is	(3)	$2\pi r$
(S)	The diagonal of a rectangle is	(4)	$\sqrt{l^2 + b^2}$

A. P-2, Q-3, R-4, S-1

B. P-2, Q-3, R-1, S-4

C. P-2, Q-1, R-3, S-4

D. P-1, Q-3, R-4, S-2

Answer: B

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2. In this section, each question has two matching lists. Choices for the correct combination of elements from List-I and List-II are given as options (a), (b), (c) and (d) out of which one is correct.

Match the following lists:

List-I		List-II
(P) The area of triangle (in sq. cm) whose base is 24 cm and whose altitude is 1.5 dm is	(1)	11
(Q) The diameter of a wheel is 1.26 m. How far will it travel in 500 revolutions in metres?	(2)	34650
(R) The height (in cm) of a cuboid where volume is 275 cm^3 and base area is 25 cm^2 is	(3)	180
(S) The circumference of the base of the cylinder is 132 cm and its height is 25 cm. The volume of the cylinder (in cm^3) is	(4)	1980

A. P-3, Q-4, R-1, S-2

B. P-4, Q-1, R-3, S-2

C. P-4, Q-1, R-2, S-3

D. P-3, Q-4, R-2, S-1

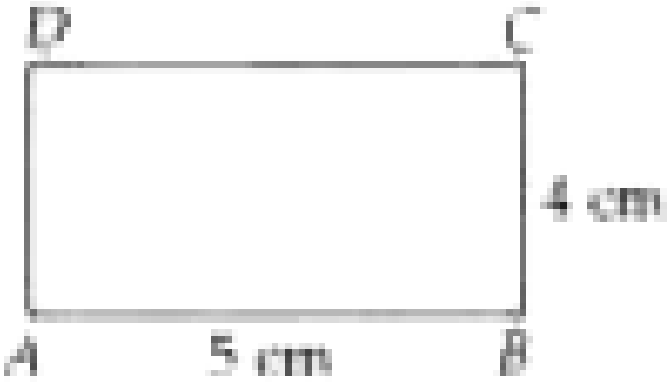
Answer: A

Watch Video Solution

Exercise Assertion Reason Type

1. Directions : In each of the following questions, a statement of Assertion is given followed by a corresponding statement of Reason just below it. Of the statements, mark the correct answer as

Assertion : In a rectangle ABCD



The perimeter of rectangle is

$5 + 4 + 5 + 4 = 18$ cm

Reason : Perimeter is the distance around a closed plane figure.

A. If both assertion and reason are true and reason is the correct explanation of

assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

2. Directions : In each of the following questions, a statement of Assertion is given followed by a corresponding statement of Reason just below it. Of the statements, mark the correct answer as

Assertion : The area of a rhombus whose side is 6 cm and altitude is 4 cm is 24 cm^2.

Reason : Area of a rhombus is sometimes equal to area of parallelogram as every parallelogram is a rhombus.

A. If both assertion and reason are true and reason is the correct explanation of

assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

3. Directions : In each of the following questions, a statement of Assertion is given followed by a corresponding statement of Reason just below it. Of the statements, mark the correct answer as

Assertion : The area of trapezium if its parallel sides are lm and 1.2 m and the perpendicular distance between them is 0.8 m is 0.98 m^2.

Reason : Area of trapezium $= \frac{1}{2}$ sum of its parallel sides $\times$ height

A. If both assertion and reason are true and reason is the correct explanation of

assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

4. Directions : In each of the following questions, a statement of Assertion is given followed by a corresponding statement of Reason just below it. Of the statements, mark the correct answer as

Assertion : Chalkbox, a match box and dice, are all examples of cube.

Reason : A solid bounded by six rectangular plane faces is called a cuboid.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

5. Directions : In each of the following questions, a statement of Assertion is given followed by a corresponding statement of Reason just below it. Of the statements, mark the correct answer as

Assertion : A sheet of paper, the water in a jug, the air inside a football, etc are examples of solids.

Reason : Anything which occupies space is called a solid.

A. If both assertion and reason are true and reason is the correct explanation of

assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

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Exercise Comprehension Type

1. Find the area of a rhombus each side of which measures 20 cm and one of whose diagonal is 24 cm

A. 380 m^2

B. 384 m^2

C. 384 cm^2

D. 38 cm^2

Answer: C

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2. PASSAGE-I: The area of a rhombus is $\frac{1}{2}(d_1 \times d_2)$ and perimeter $= 2\sqrt{(d_1^2 + d_2^2)}$, where d_1 and d_2 are the diagonals of the rhombus.

The area of the field in the form of rhombus if the length of each side be 14 cm and the altitude be 16 cm is

A. 224 cm^2

B. 210 cm^2

C. 148 cm^2

D. 228 cm^2

Answer: A

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3. The area of a rhombus is $84\,m^2$. If its perimeter is 40m, then find its altitude.

A. 4.8 m

B. 8.4 m

C. 6.8 m

D. 4.9 m

Answer: B

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4. PASSAGE-II : The area of trapezium equals half the sum of parallel sides multiplied by its height. The altitude of a trapezium when, the sum of the lengths of whose parallel sides is 6.5 cm and whose area is 26 cm^2 is

A. 20 m

B. 4 cm

C. 6 cm

D. 8 cm

Answer: D

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5. Find the sum of the lengths of the bases of a trapezium whose altitude is 11cm and whose area is $0.55\ m^2$.

A. 10 m

B. 10 cm

C. 1000 m

D. 40 cm

Answer: A

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6. If the perimeter of a trapezium be $52cm$, its non parallel sides are equal to $10cm$ each and its altitude is $8cm$, find the area of the trapezium.

A. $138m^2$

B. $128m^2$

C. $130cm^2$

D. $128cm^2$

Answer: D

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Exercise Subjective Problems Very Short Answer Type

1. How many metres of the carpet 75 cm wide will be required to cover the floor of a room which is 20 metres long and 12 metres broad?

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2. How many paving stones each measuring 2.5 m $\times$ 2 mare required to pave the rectangular courtyard 30 m long and 16.5 m wide?

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3. A rectangular grassy plot is 112 m by 78 m. It has a gravel path 2.5 m wide all round it on the inside. Find the area of the path and the cost of constructing it at Rs. 2 per square metre.

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4. What will be the ratio of the circumference to the diameter of the circle if its original radius is tripled ?

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5. There are two 2 m wide cross roads in a lawn 150 m by 120 m dimensions. One of the roads is parallel to the length and the other is parallel to the breadth. If it costs Rs. 2 per sq. metre for levelling the road, what would be the cost involved?

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6. A cuboidal vessel is 10 cm long and 8 cm wide. How high must it be made to hold 480 cubic

centimetres of a liquid ?

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7. Find the volume in cu. dm of the cube whose side is 1.2 m.

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8. The radii of two right circular cylinders are in the ratio $1:2$ and their heights are in the ratio

$4:3$. Calculate the ratio of their curved surface areas.

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9. A cuboidal wooden box has length = 1.5 m, breadth = 25 cm and height = 15 cm. Find its volume.

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10. The area of the base of a right cylinder is 154 cm^2 and its height is 15 cm. Find its volume.

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Exercise Subjective Problems Short Answer Type

1. If the length of a rectangle increases by 10% and the breadth of the rectangle decreases by 12% then find the % change in area.

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2. The front wheels of a wagon are 2π m in circumference and the back wheels are 3π m in circumference. When the front wheels have made 10 more revolutions than the back wheels, how many metres has the wagon travelled?

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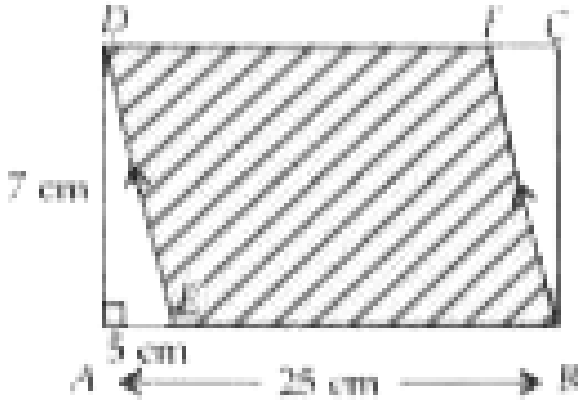
3. Find the area of the shaded regions.



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4. Eight identical cuboidal wooden blocks are stacked one on top of the other. The total volume of the solid so formed is $128\ cm^3$. If the

height of each block is 1cm and the base is a square, find the dimensions of each block.

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5. Find the volume in cubic metres (cu. m) of each of the cuboids whose dimensions are :

Length= 10 m, breadth= 8 m, height= 2.5 m

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6. Find the volume in cubic metres (cu. m) of each of the cuboids whose dimensions are :

Length= 2 m, breadth= 1.5 m, height = 25 cm

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7. A rectangular water reservoir contains 42000 litres of water. Find the depth of the water in the reservoir if its base measures 6m by 3.5m.

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8. What is the weight of a cubical block of ice 50cm in length, if one cubic metre of ice weighs 900 kilograms?

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9. A solid cube is cut into two cuboids of equals volumes. Find the ratio of the total surface area of the given cube to one of the cuboids.

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10. The radius of the base of a cylindrical water-drum open at the top at the top is 35 cm and height 1.3m. Find the inner surface area of the water-drum.

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11. The rain water that falls on a roof of area $6160\, m^2$ is collected in a cylindrical tank of diameter 14m and height 10m and thus the tank is completely filled. Find the height of rain water on the roof.

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Exercise Long Answer Type

1. 11. The parallel sides of a trapezium are 20 cm and 10 cm. Its nonparallel sides are both equal. each being 13 cm. Find the area of the trapezium.

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2. The length of a room is one and a half times its breadth. The cost of carpeting the room at

$Rs.3.25\ per\ m^2\ is\ Rs.175.50$ and the cost of papering the walls at $Rs.1.40\ per\ m^2 is\ Rs.240.80$. If 1 door and 2 window occupy $8\ m^2$, find the dimensions of the room.

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3. The external length, breadth and height of a closed rectangular wooden box are 18cm, 10cm and 6cm respectively and thickness of wood is $\frac{1}{2}cm$. When the box is empty, it weight 15kg and

when filled with sand it weighs 100kg. Find the weight of one cubic cm of weed and cubic cm of sand.

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4. An open rectangular cistern when measured from outside is 1.35 m long, 1.08 m broad and 90 cm deep. It is made up of iron, which is 2.5 cm thick. Find the capacity of the cistern and the volume of the iron used.

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5. A solid iron rectangular block of dimensions 4.4 m , 2.6 m and 1 m is cast into a hollow cylindrical pipe of internal radius 30 cm and thickness 5 cm.Find the length of the pipe.

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Exercise Integer Numerical Value Type

1. The ratio between the length and the perimeter of a rectangular plot is $1:3$. The ratio

between the length and breadth of the plot is $k:1$. Find k.

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2. The cost of carpeting a room 18 m long with a carpet 75 cm wide at Rs. 4.50 per metre is Rs. 810. The breadth of the room is $(k-0.5)$m. The value of k is

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3. The area of a rhombus whose diagonals are 10 cm and 12 cm is $x \quad \mathrm{cm}^2$. The value of x is

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4. The area of a parallelogram with base 14 cm and altitude 8 cm is $y \ \mathrm{cm}^2$. The value of $(y - 110)$ is

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5. The altitude of a trapezium whose area is 105 cm^2 and base are 14 cm and 7 cm is h cm. The value of h is

Watch Video Solution

6. The area of a triangular garden is 9520 m^2. If its base is 340 m, the altitude is a m. The value of $\frac{a}{8}$ is

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7. Three metal cubes of sides 5 cm, 4 cm and 3 cm respectively are melted and recast into a new cube. The edge of the new cube so formed is ____ cm.

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8. A milk container is 8 cm long and 50 cm wide. The height of the container, so that it can hold 4 litres of milk is k cm. The value of k is

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9. The radius and height of a cylinder are in the ratio $5:7$ and its volume is 4400 cm^3. Find the unit digit of height.

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10. Unit digit of the surface area of a chalk box, whose length, breadth and height are 16 cm, 8 cm and 6 cm respectively, is

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Olympiad Hots Corner

1. The volume of two cubes are in the ratio 1 : 64. If the volume of the larger cube is 504 cm^3 more than that of the smaller cube, then

(i) What is the volume of the smaller cube?

(ii) What is the length of each side of the larger cube?

	i	ii
A.	8cm^3	8cm
B.	8cm^3	7cm
C.	7cm^3	8cm

D.

i	ii
7cm^3	9cm

Answer: A

Watch Video Solution

2. Match the following:

	List-I		List-II
(P)	A cylindrical roller is of length 2 m and diameter 84 cm. The number of revolutions it has to make to cover an area of 7920 m^2 is	(1)	17600
(Q)	The circumference of the base of a right circular cylinder is 176 cm. If the height of the cylinder is 1 m, the lateral surface area (in sq. cm) of the cylinder is	(2)	1500
(R)	The dimensions of a cuboid are in the ratio 5 : 2 : 1. Its volume is 1250 cubic metres. Its total surface area (in sq. m) is	(3)	9
(S)	If the total surface area of a cubical tank is 486 sq. m, the length (in m) of one side is	(4)	850

A. P ➔ (2), Q ➔ (1), R ➔ (4), S ➔ (3)

B. P ➔ (1), Q ➔ (2), R ➔ (3), S ➔ (4)

C. P ➔ (3), Q ➔ (4), R ➔ (1), S ➔ (2)

D. P ➔ (4), Q ➔ (3), R ➔ (2), S ➔ (1)

Answer: A

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3. A swimming bath is 24 m long and 15 m broad. When a number of men dive into the bath, the height of the water rises by 1 cm. If the average amount of water displaced by one of the men be

0.1 cu. m, how many men are there in the bath?

(a) 32 (b) 36 (c) 42 (d) 46

A. 42

B. 46

C. 32

D. 36

Answer: D

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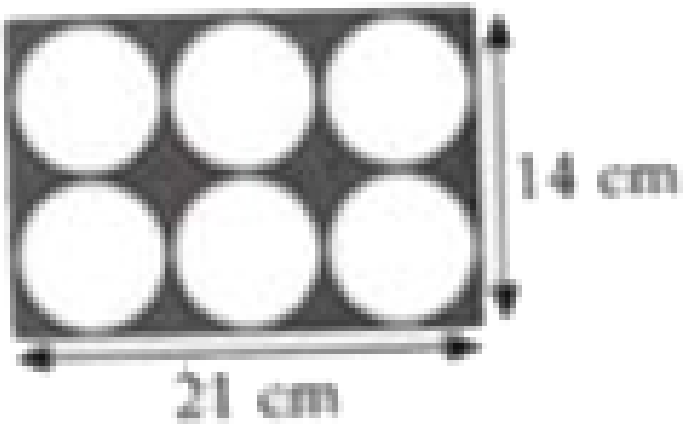
4. Sam cut out 6 identical circles from a rectangular piece of paper shown in the figure. Find the shaded area. $\left(\text{Take} \pi = \frac{22}{7} \right)$



A. 62 cm^2

B. 294 cm^2

C. 63 cm^2

D. 98 cm^2

Answer: C

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5. The perimeter of the rectangular field is 406 m. What will be its area if its length is 43 m more than its breadth?

A. 1520 m^2

B. 9840 m^2

C. 2480 m^2

D. 8240 m^2

Answer: B

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6. A regular octagon is formed by cutting an isosceles right triangle from each of the corners of a square with side 15 cm. The area (in cm^2) of the octagon is

A. $\frac{30}{\sqrt{2}+1}$

B. $\frac{450}{\sqrt{2}-1}$

C. $\frac{30}{1-\sqrt{2}}$

D. $\frac{450}{\sqrt{2}+1}$

Answer: D

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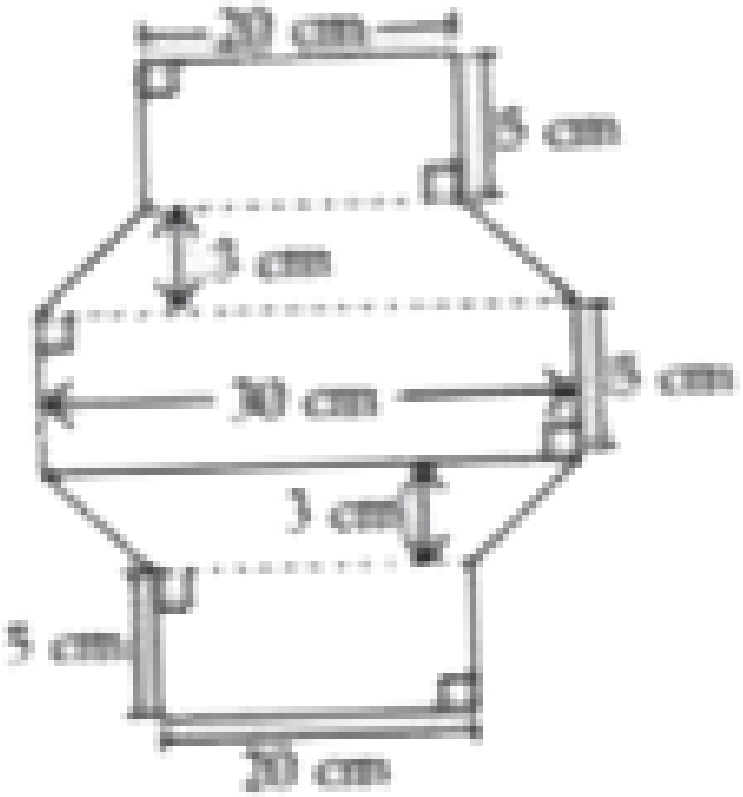
7. Find the area of the given figure (not drawn to scale).



A. 650 cm^2

B. 500 cm^2

C. 575 cm^2

D. 525 cm^2

Answer: B

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8. If the height of a cylinder becomes $\frac{1}{2}$ of the original height and the radius is doubled, then volume of cylinder becomes _____ of its original volume.

A. 2 times

B. $\frac{1}{2}$ times

C. $\frac{1}{4}$ times

D. 3 times

Answer: A

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9. If the areas of three adjacent faces of a cuboid are $x,\ y,\ z$ respectively, then the volume of the cuboid is xyz (b) $2xyz$ (c) $\sqrt{xyz}$ (d) $3\sqrt{xyz}$

A. $\sqrt{xyz}$

B. $x + y + z$

C. x^2yz

D. $xy + z$

Answer: A

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10. The edge of a cube is doubled then the percentage increase in the volume of cube is

A. $100\ \%$

B. $500\ \%$

C. $300\ \%$

D. $700\ \%$

Answer: D

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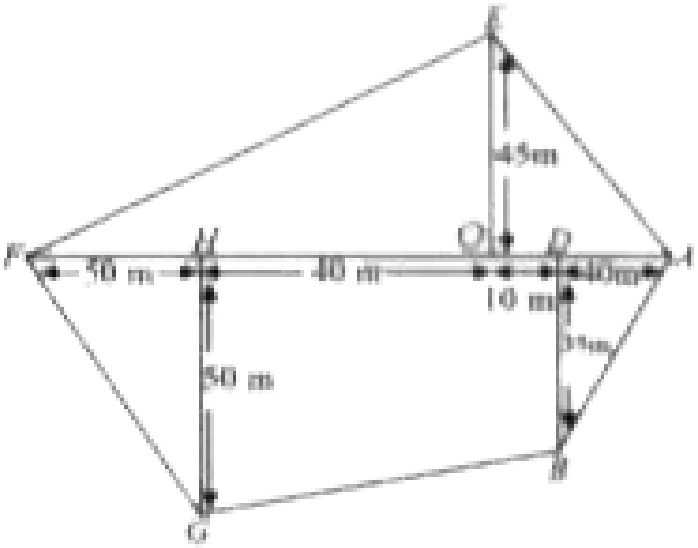
11. The area of the field ABGFEA (not drawn to scale) is



A. 7225 m^2

B. 7230 m^2

C. 7235 m^2

D. 7240 m^2

Answer: A

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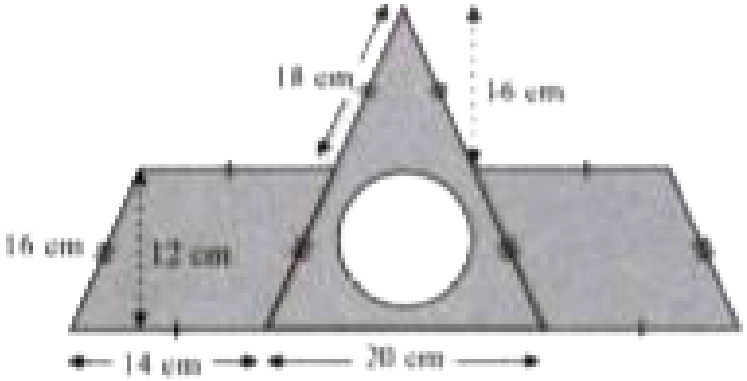
12. If radius of circle is 7 cm, then the perimeter of the figure and area shaded portion of the given figure respectively is



A. 144 cm, 462 cm^2

B. 156 cm, 462 cm^2

C. 122 cm, 294 cm^2

D. 144 cm, 394 cm^2

Answer: A

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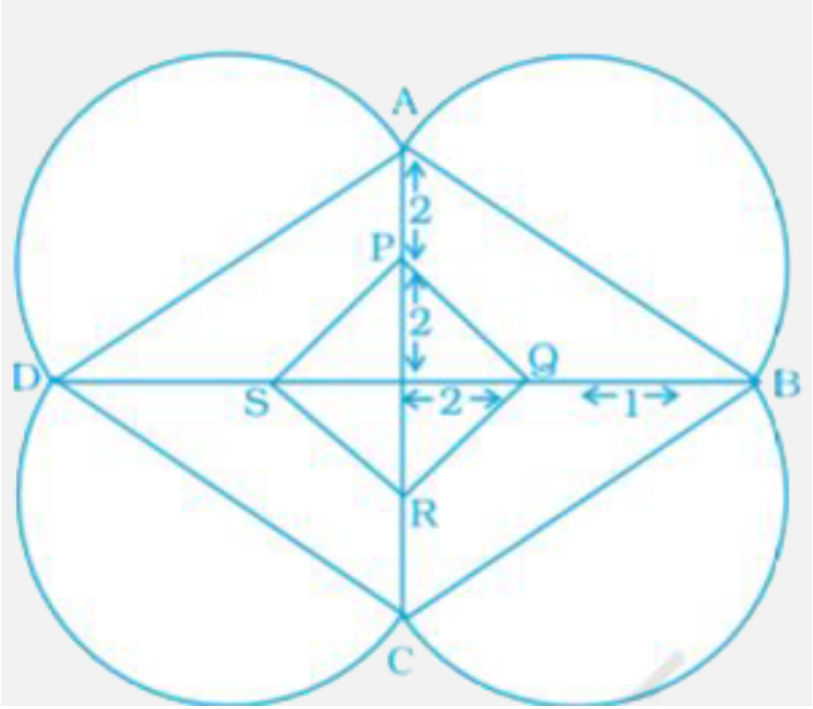
13. A Rangoli has been drawn on a flor of a house. ABCD and PQRS both are in the shape of a rhombus. Find the radius of semicircle drawn on

each side of rhombus ABCD.



A. 142.843 cm^2

B. 128.973 cm^2

C. 39.286 cm^2

D. 157.14 cm^2

Answer: D

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14. The difference of the area of the circumscribed and the inscribed square of a

circle is 35 sq. cm. Find the area of the circle.

A. 55 sq. m

B. 70 sq. m

C. 55 sq. cm

D. 70 sq. cm

Answer: C

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15. An icecream company makes a popular brand of icecream in a rectangular shaped bar 6 cm long 5 cm wide and 2 cm thick. To cut costs, the company has decided to reduce the volume of the box by 20%. The thickness will remain the same but the length and width will be decreased by the same percentage amount. Which

condition given below will the new length l satisfy ?

A. $5.5 < l < 6$

B. $5 < l < 5.5$

C. $4.5 < l < 5$

D. $4 < l < 4.5$

Answer: B

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16. A rectangular block of wood has dimensions 24 cm by 9 cm by 7 cm. It is cut into bricks. Each brick is a cube of side 3 cm. Find the largest number of bricks that can be cut from the block.

A. 48

B. 56

C. 49

D. 52

Answer: A

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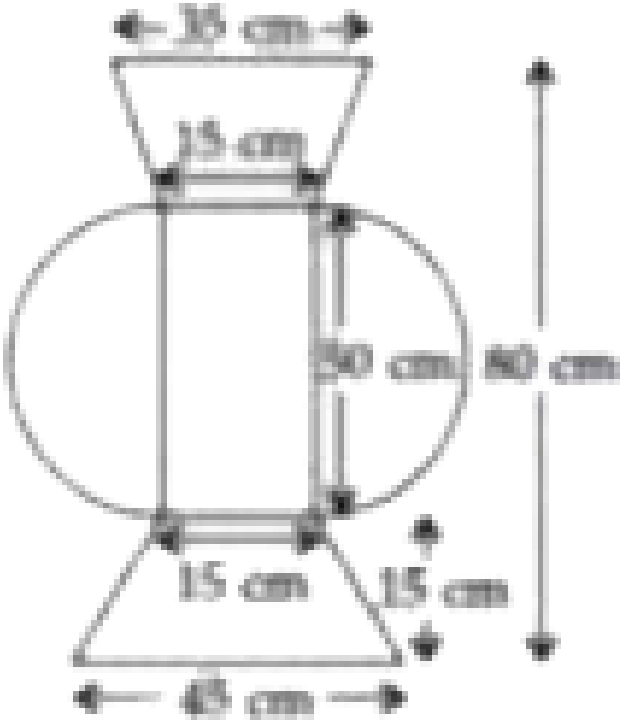
17. Find the area of the given figure (not drawn to scale).



A. 3339.29 cm^2

B. 3539.29 cm^2

C. 3539.29 cm^2

D. 5967.47 cm^2

Answer: B

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18. Sum of the lengths of all edges of a cube is x metres. If the surface area of the cube is x sq. metres, then its volume (in cubic metres) is

A. x^3

B. 8

C. x

D. 2

Answer: B

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19. If one of the diagonals of a rhombus is equal to its side, then the diagonals of the rhombus are in the ratio

A. $\sqrt{3}:1$

B. $\sqrt{2}:1$

C. $3:1$

D. $2:1$

Answer: A

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20. Three cubes with sides in the ratio 3 : 4 : 5 are melted to form a single cube whose diagonal is $12\sqrt{3}cm$. The sides of the cubes are (a) 3 cm,

4 cm, 5 cm (b) 6 cm, 8 cm, 10 cm (c) 9 cm, 12 cm, 15 cm (d) None of these

A. 6 cm, 8 cm, 10 cm

B. 3 cm, 4 cm, 5 cm

C. 9 cm, 12 cm, 15 cm

D. 12 cm, 16 cm, 20 cm

Answer: A