



# MATHS

## BOOKS - MBD

### MENSURATION

#### Example

1. A square and a rectangular field with measurements as given in the figure have the

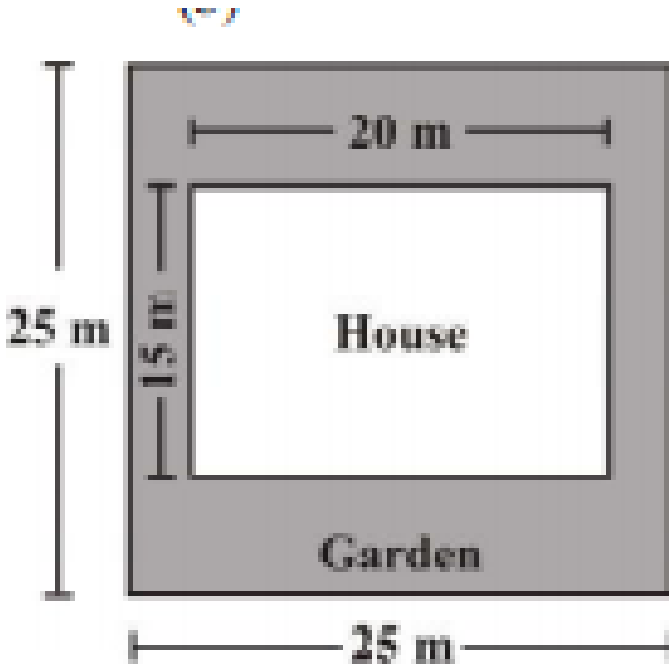
same perimeter. Which field has a larger area ?



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2. Mrs. Kaushik has a square plot with the Bmeasurement as shown in the 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

*Rs55perm<sup>2</sup>.*



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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 =  $20 - (3.5 + 3.5) = 13$  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

$1080m^2$ ? (If required you can split the tiles in whatever way you want to fill up the corners).



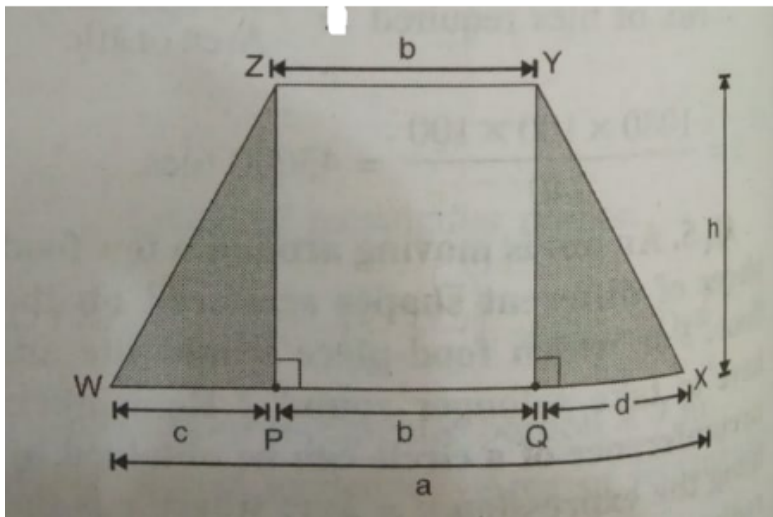
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5. An ant is moving around a few food pieces of different shapes scattered on the floor. For which food-piece would the ant have to take a longer round? Remember, circumference of a circle can be obtained by using the expression  $C = 2\pi r$ , where  $r$  is the radius of the circle.



6. Nazma's sister also has a trapezium shaped plot. Divide it into three parts as shown in the figure. Show that the area of trapezium

$$WXYZ = \frac{h(a + b)}{x}$$



7. If  $h=10$  cm, $c=6$ cm, $b=12$  cm, $d=4$  cm,find the values of each of its parts separately and add to find the area WXYZ.Verify it by putting the values of  $h,a$  and  $b$  in the expression  $\frac{h(a + b)}{2}$ .



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8. Find the area of the following trapezium:



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9. Find the area of the quadrilateral:

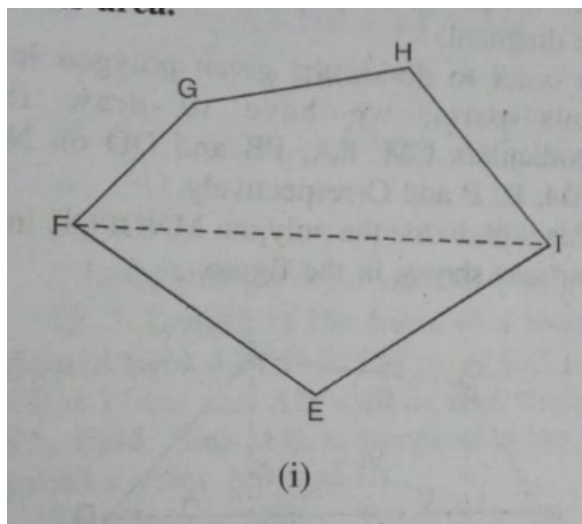


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10. Divide the following polygons(fig.)into parts (triangles and trapezium) to find out its area.



FI is a diagonal of polygon EFGHI



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11. NQ is a diagonal of polygon MNOPQR. Find the area of the polygon MNOPQR.



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12. Polygon ABCDE is divided into parts as shown below(fig.) .Find its area if  $AD=8\text{cm}$ ,  $AH=6\text{cm}$ ,  $AG=4\text{cm}$ ,  $AF=3\text{ cm}$  and perpendiculars  $BF=2\text{ cm}$ ,  $CH=3\text{ cm}$ ,  $EG=2.5\text{ cm}$ .



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13. Find the area of polygon MNOPQR (as shown in the fig.),if

$MP = 9$  cm,  $MD = 7$  cm,  $MC = 6$  cm,  $MB = 4$  cm,  $MA = 2$  cm.

$NA$ ,  $OC$ ,  $QD$  and  $RB$  are perpendiculars to diagonal  $MP$ .



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**14.** The shape of 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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**15.** The area of a trapezium is  $34\text{cm}^2$  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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**16.** Length of the fence of a trapezium shaped field ABCD is 120 m. If  $BC=48\text{m}$ ,  $CD = 17\text{ m}$  and  $AD=40\text{ m}$ , find the area of this field. Side AB is perpendicular to the parallel sides AD and BC.



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**17.** 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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**18.** The diagonals of a rhombus are 7.5 cm and 12 cm. Find its area.



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**19.** Find the area of a rhombus whose side is 5 cm and whose altitude is 4.8 cm. If one of its diagonals is 8 cm long, find the length of the other diagonal.



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**20.** 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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21. 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  $10,500 \text{ cm}^2$  and the perpendicular distance between the two parallel sides is 100cm, find the length of the side along the river.



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**22.** 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.



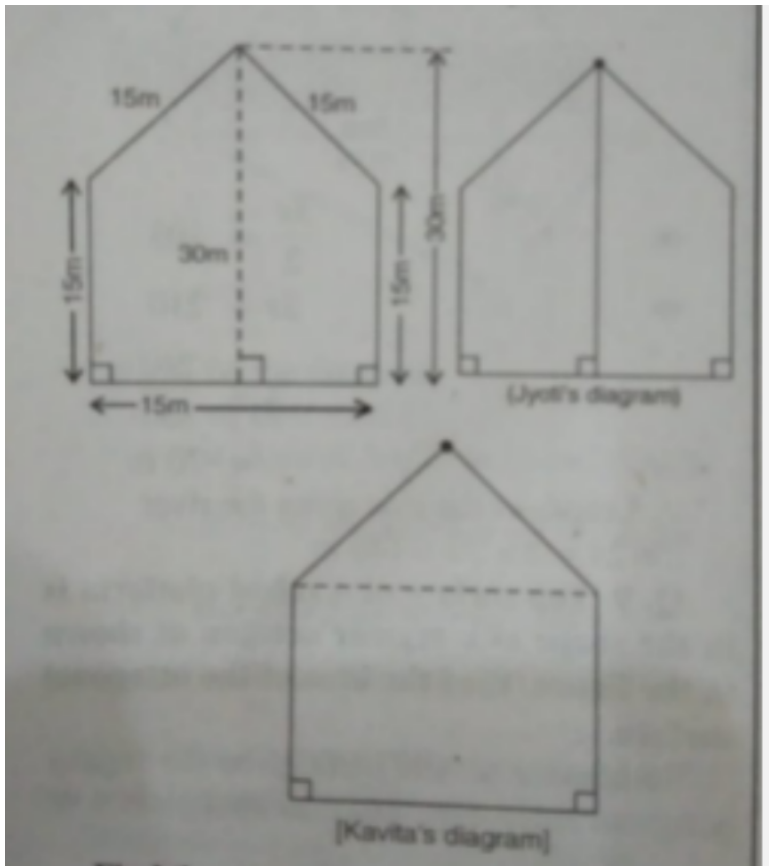
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**23.** There is a pentagonal shaped park as shown in the figure. For finding its area Jyoti and Kavita divided it in two different ways.

Find the area of this park using both ways. Can



you suggest some another way of finding its area?



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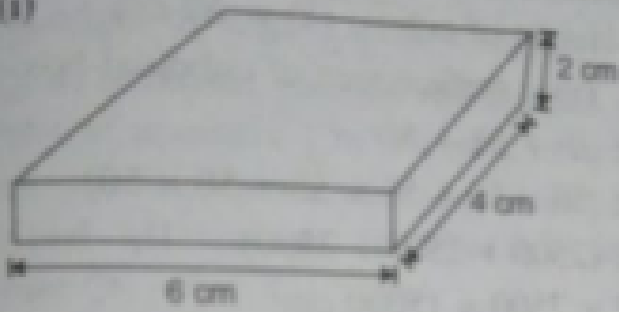
**24.** Diagram of the adjacent picture frame has outer dimensions  $24\text{cm} \times 28\text{cm}$  and inner dimensions  $16\text{cm} \times 20\text{cm}$ . Find the area of each section of the frame, if the width of each section is same.



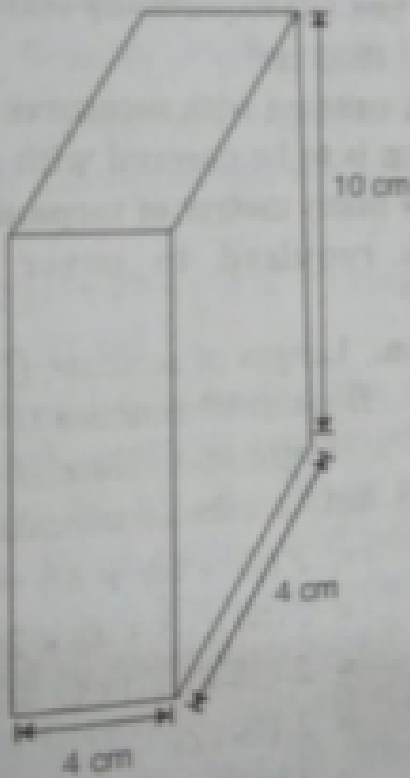
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**25.** Find the total surface area of the following cuboids.

(i)

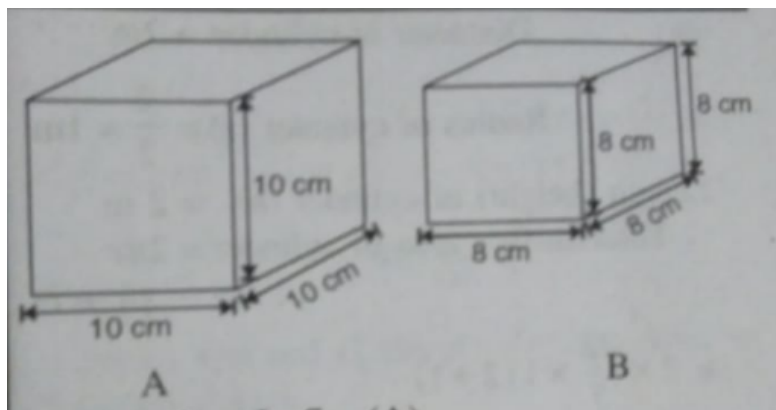


(ii)



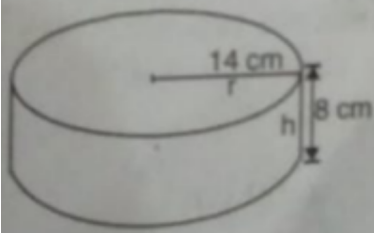
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26. Find the surface area of cube A and lateral surface area of cube B.

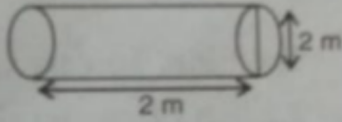


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27. Find total surface area of the following cylinders:.



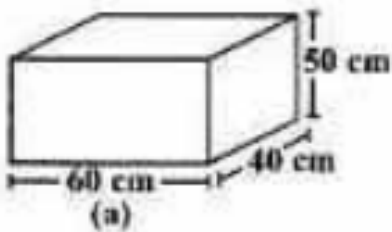
(i)



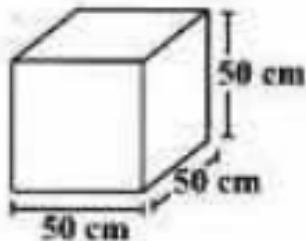
(ii)

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28. There are two cuboidal boxes as shown in the adjoining figure. Which box requires the lesser amount of material to make?



(a)



(b)



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**29.** A suitcase with measures  $80\text{cm} \times 48\text{cm} \times 24\text{cm}$  is to be covered with a tarpaulin cloth. How many metres of tarpaulin of width 96 cm is required to cover 100 such suitcases?



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**30.** Find the side of a cube whose surface area is  $600\text{cm}^2$ .



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**31.** Rukhsar painted the outside of the cabinet of measure  $1\text{m} \times 2\text{m} \times 1.5\text{m}$ . How much surface area did she cover if she painted all except the bottom of the cabinet?



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**32.** 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  $100m^2$  of area is painted. How many cans of paint will she need to paint the room?



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**33.** Describe how the two given figures are like and how they are different? Which box has larger lateral surface area?





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**34.** 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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**35.** The lateral surface area of a hollow cylinder is  $4224\text{cm}^2$ . 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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**36.** 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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37. 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 the figure). If the label is placed 2 cm from top and bottom, what is the area of the label?



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**38.** Find the volume of the following cubes:

with a side 4 cm



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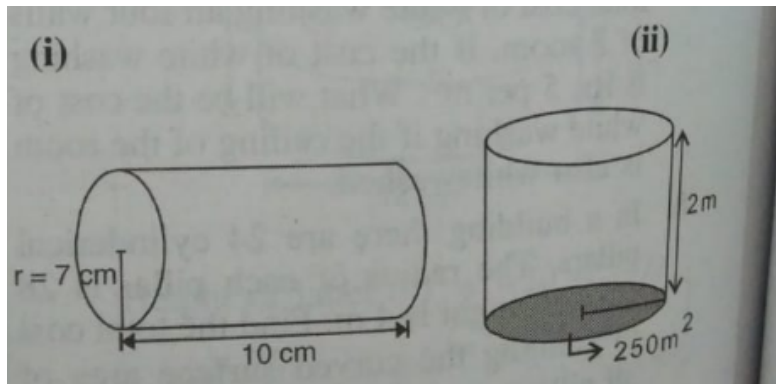
**39.** Find the volume of the following cubes:

with a side 1.5 m



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40. Find the volume of the following cylinders:



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41. Given a cylindrical tank, in which situation will you find surface area and in which situation volume: To find the number of

smaller tanks that can be filled with water from it.



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**42.** Given a cylindrical tank, in which situation will you find surface area and in which situation volume: Number of cement bags required to plaster it.



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**43.** Given a cylindrical tank, in which situation will you find surface area and in which situation volume: To find the number of smaller tanks that can be filled with water from it.



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**44.** 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 whether the cylinder with greater volume also has greater surface area?



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**45.** Find the height of a cuboid whose base area is  $180\text{cm}^2$  and volume is  $900\text{cm}^3$ ?



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**46.** A cuboid is of dimensions  $60\text{cm} \times 54\text{cm} \times 30\text{cm}$ . How many small cubes with side 6 cm can be placed in the given cuboid?



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**47.** Find the height of the cylinder whose volume is  $1.54\text{m}^3$  and diameter of the base is 140 cm ?



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**48.** 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 in the tank?



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**49.** If each edge of a cube is doubled: how many times will its surface area increase?



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50. If each edge of a cube is doubled: how many times will its volume increase?



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51. Water is pouring into a cuboidal reservoir at the rate of 60 litres per minute. If the volume of reservoir is  $108m^3$ , find the number of hours it will take to fill the reservoir.



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## Exercise

1. Find the area of a parallelogram whose base is 20 cm and the corresponding height 5 cm.



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2. Find the base of parallelogram whose area is  $400 \text{ cm}^2$  and whose height is 8 cm.



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3. Find the height of a triangle whose base is 60 cm and whose area is  $600 \text{ cm}^2$ .



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4. Find the area of an equilateral triangle of sides 8 dm each.



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5. Find the base of a parallelogram, which has an area of  $840 \text{ cm}^2$  and normal on base is 21

cm.



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6. A garden is 30 m long and 25 m broad. A path 5 m wide is to be built outside around it. Find the area of the path.



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7. A verandah 1 m wide is constructed all along the outside of a room 5 m long and 4 m

wide. Find :

the area of the Verandah



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8. A verandah 1 m wide is constructed all along the outside of a room 5 m long and 4 m wide. Find :

the cost of cementing the floor of the verandah at the rate of Rs.25 per  $m^2$ .



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9. The diagonals of a rhombus are 15 cm and 20 cm. What is its area?



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10. A diagonal of a quadrilateral is 28.4 m long. The perpendiculars to the diagonal from opposite vertices are of lengths 7.20 m and 8.80 m. Find the area of the quadrilateral.



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**11.** The area of a trapezium is  $35\text{cm}^2$  and one base and altitude are 5 cm and 10 cm respectively. Find the length of other.

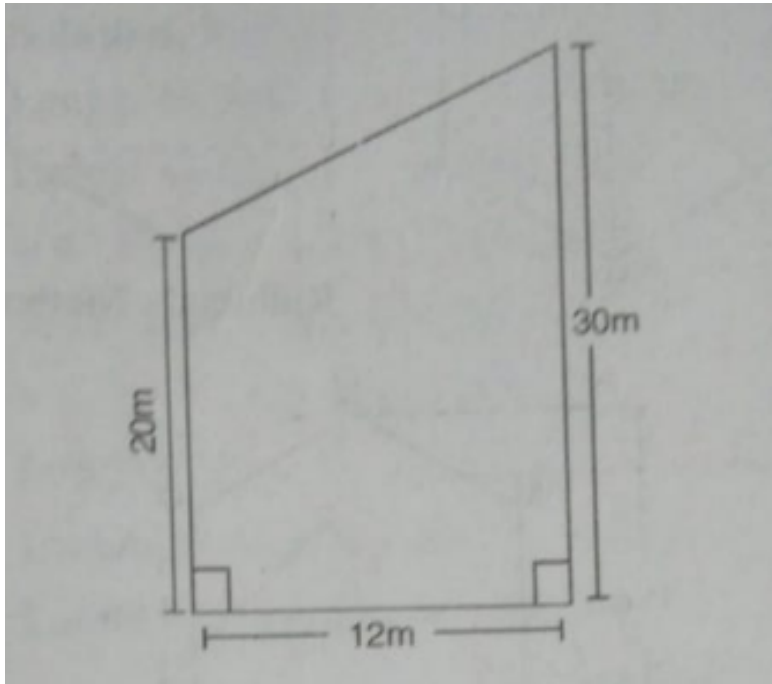


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**12.** Nazma owns a plot near a main road.

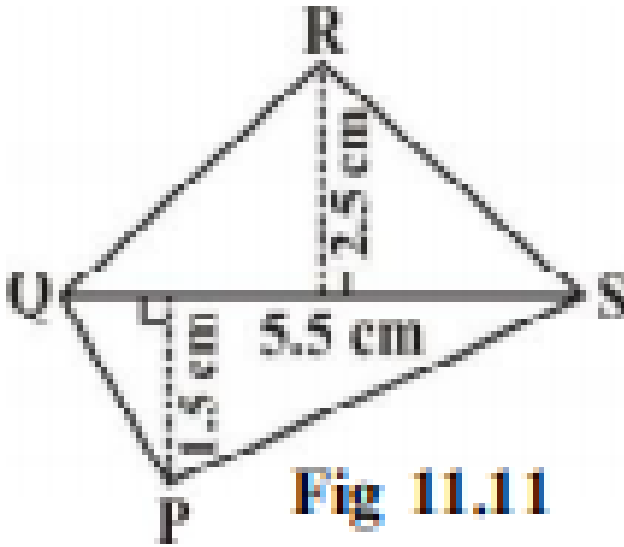
Unlike some other rectangular plots in her neighbourhood, the plot has only one pair of parallel opposite sides. So, it is nearly a

trapezium in shape. Find the area of plot.



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**13.** Find the area of quadrilateral PQRS shown in Fig 11.11.



**Fig 11.11**



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14. Find the area of a rhombus whose diagonals are of lengths 10 cm and 8.2 cm.



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**15.** The area of a trapezium shaped field is  $480m^2$  , the distance between two parallel sides is 15 m and one of the parallel side is 20 m. Find the other parallel side.



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**16.** The area of a rhombus is  $240cm^2$  and one of the diagonals is 16 cm. Find the other diagonal.



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17. There is a hexagon  $MNOPQR$  of side 5 cm (Fig 11.20). Aman and Ridhima divided it in two different ways (Fig 11.21). Find the area of this hexagon using both ways.

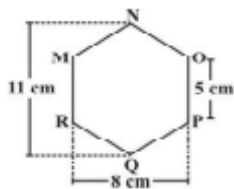
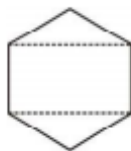
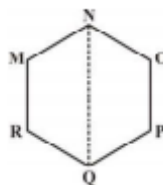


Fig 11.20



Ridhima's method



Aman's method



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**18.** Find the surface area of the cuboid whose dimensions are 40 cm xx 25 cm xx 8 cm.



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**19.** A cuboidal oil tin is 50 cm by 30 cm by 40 cm. Find the cost of the tin required for making 20 such tins. If the cost of tin sheet is Rs. 20 per square metre.



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**20.** Find the cost of painting 12 pillars each of diameter 48 cm and height 7 m at the rate of Rs.2.50 per  $m^2$ .



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**21.** A right circular cylinder has base radius 8 cm and height 35 cm. Find the curved surface area of the cylinder.



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22. The radius of the base of a closed right circular cylinder is 21 cm and its height is 100 cm. Find the total surface area of the cylinder.



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23. An aquarium is in the form of a cuboid whose external measures are  $80\text{cm} \times 30\text{cm} \times 40\text{cm}$ . The base, side faces and back face are to be covered with a coloured paper. Find the area of the paper needed?



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**24.** The internal measures of a cuboidal room are  $12m \times 8m \times 4m$ . Find the total cost of whitewashing all four walls of a room, if the cost of white washing is Rs 5 per  $m^2$ . What will be the cost of white washing if the ceiling of the room is also whitewashed.



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**25.** In a building there are 24 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 all pillars at the rate of  $Rs8perm^2$ .



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**26.** Find the height of a cylinder whose radius is 7 cm and the total surface area is  $968cm^2$ .



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27. The length of a road roller is 2m and the diameter of its edges is 50 cm.It takes 700 revolutions to level a ground .Find the area of the field.



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28. Find the volume of a cuboid with dimensions  $10\text{cm} \times 8\text{cm} \times 6\text{cm}$ .



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**29.** Find the surface area and volume of a cylinder whose radius is 7 cm and height is 8 cm.



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**30.** Find the curved surface area of a cylinder if its volume is  $6358 \text{ cm}^3$  and height is 28 cm.



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**31.** A cylindrical bucket, 28 cm in radius is filled with water to 15 cm in height. If a rectangular solid of size  $70\text{cm} \times 56\text{cm} \times 66\text{ cm}$  is immersed in the water, find the height by which water rises in the bucket.



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**32.** Find the height of a cuboid whose volume is  $275\text{cm}^3$  and base area is  $25\text{cm}^2$



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**33.** A godown is in the form of a cuboid of measures  $60m \times 40m \times 30m$ . How many cuboidal boxes can be stored in it if the volume of one box is  $0.8m^3$  ?



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**34.** A rectangular paper of width 14 cm is rolled along its width and a cylinder of radius 20 cm is formed. Find the volume of the

cylinder ?



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**35.** A rectangular piece of paper  $11\text{cm} \times 4\text{cm}$  is folded without overlapping to make a cylinder of height 4 cm. Find the volume of the cylinder.



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**36.** The ..... of closed plane figure is the distance around its boudary.

A. Area

B. Peimeter

C. Volume

D. None of these.

**Answer:**



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37. The ..... of a closed plane figure is the region covered by it.

A. Volume

B. Peimeter

C. Area

D. None of these.

**Answer:**



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**38.** Area of a rectangle = ..... . The blank space is filled by:

A. Length x Breadth

B. Length + Breadth

C. Length-Breadth

D. Length/Breadth

**Answer:**



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39. Area of a triangle = ..... .Fill in the blank.

A. Base x altitude

B.  $\frac{1}{2} \times base \times A < itude$

C.  $\frac{1}{2}$  (Base+ Altitude)

D.  $\frac{1}{2} (Base \div A < itude)$

**Answer:**



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40. Area of trapezium =  $\frac{1}{2}$  x Height

(.....).The blank space is filled by:

A. Product of the parallel sides

B. differences of parallel sides

C. Quotient of parallel sides

D. Sum of the parallel sides.

**Answer:**



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41. Area of a square is = ..... , the blank space is filled by:

- A. Sum of sides
- B. Product of sides
- C. Difference of sides
- D. Quotient of sides

**Answer:**



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42. The area of a rhombus is .....the product of its diagonals.The blank space is filled by:

A. Half

B. Twice

C. Thrice

D. Four times.

**Answer:**



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43. Curved surface area of a cylinder =.,the blank space is filled by:

A.  $\pi r h$

B.  $2\pi r h$

C.  $\pi r^2 h$

D.  $\pi r^3 h$ .

**Answer:**



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44. Total surface area of a cylinder =  $2 \times 3.14 \times r$   
(.....), the blank space is filled by:

A.  $r \div h$

B.  $r - h$

C.  $r \times h$

D.  $r + h$ .

**Answer:**



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**45.** Area of the four walls of a room = .... of  
base  $\times$  Height of the room. The blank space is  
filled by:

A. Area

B. Perimeter

C. Diameter

D. Volume.

**Answer:**



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**46.** Volume of cuboid = ..... of base x Height. The blank space is filled by :

A. Area

B. Perimeter

C. Volume

D. Diameter.

**Answer:**



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47. Volume of a cylinder = ..... ,The blank space is filled by:

A.  $\pi r^2$

B.  $\pi e r h$

C.  $\pi e r^2 h$

D.  $2\pi e r h$ .

**Answer:**



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**48.** The lengths of the diagonals of a rhombus are 10 cm and 8.2 cm .Its area will be :

A.  $18.2cm^2$

B.  $18.2cm$

C.  $82cm^2$

D.  $41cm^2$ .

**Answer:**



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**49.** The area of a rhombus is  $240\text{cm}^2$  and one of the diagonals is 16 cm. Find the other diagonal.

A. 15 cm

B. 20 cm

C. 30 cm

D. 25 cm.

**Answer:**



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50. The total surface area of a cylinder is  $968\text{cm}^2$  and its radius is 7 cm. Its height will be :

A. 10 cm

B. 15 cm

C. 20 cm

D. 30 cm.,

**Answer:**



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51. The surface area of cube is  $600\text{cm}^2$ . Length of its side will be :

A. 6 cm

B. 10 cm

C. 16 cm

D. 15 cm.

**Answer:**



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52. Find the height of a cuboid whose base area is  $180\text{cm}^2$  and volume is  $900\text{cm}^3$ ?

A. 4 cm

B. 6 cm

C. 5 cm

D. 8 cm.

**Answer:**



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53. If each edge of a cube is doubled, then its surface area will be increased .....times. The blank space is filled by:

A. 4

B. 8

C. 2

D. 3

**Answer:**



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54. If each edge of a cube is doubled then its volume will be increased ..... times. The blank space is filled by:

A. Four

B. Eight

C. Three

D. Two.

**Answer:**



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55. A godown is in the form of a cuboid of measures  $60m \times 40m \times 30m$ . How many cuboidal boxes can be stored in it if the volume of one box is  $0.8m^3$  ?

A. 72000

B. 80000

C. 90000

D. 75000

**Answer:**



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