

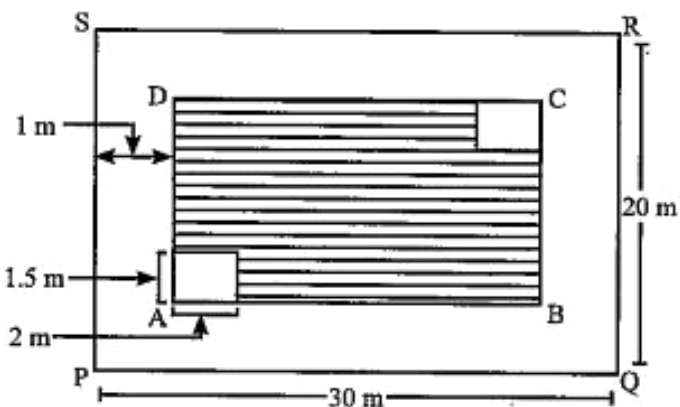


MATHS

BOOKS - SWAN PUBLICATION

MENSURATION

Questions



1.

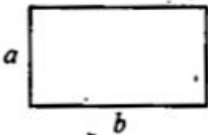
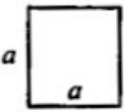

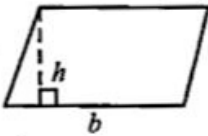
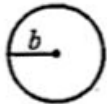
This is a figure of a rectangular park (see figure) whose length is 30m and width is 20m.

What is the total length of the fence surrounding it?



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2. Match the following:

Diagram	Shape	Area
	rectangle	$a \times a$
	square	$b \times h$
	triangle	πb^2
	parallelogram	$\frac{1}{2} b \times h$
	circle	$a \times b$

Can you write an expression for the perimeter of each of the above shapes?

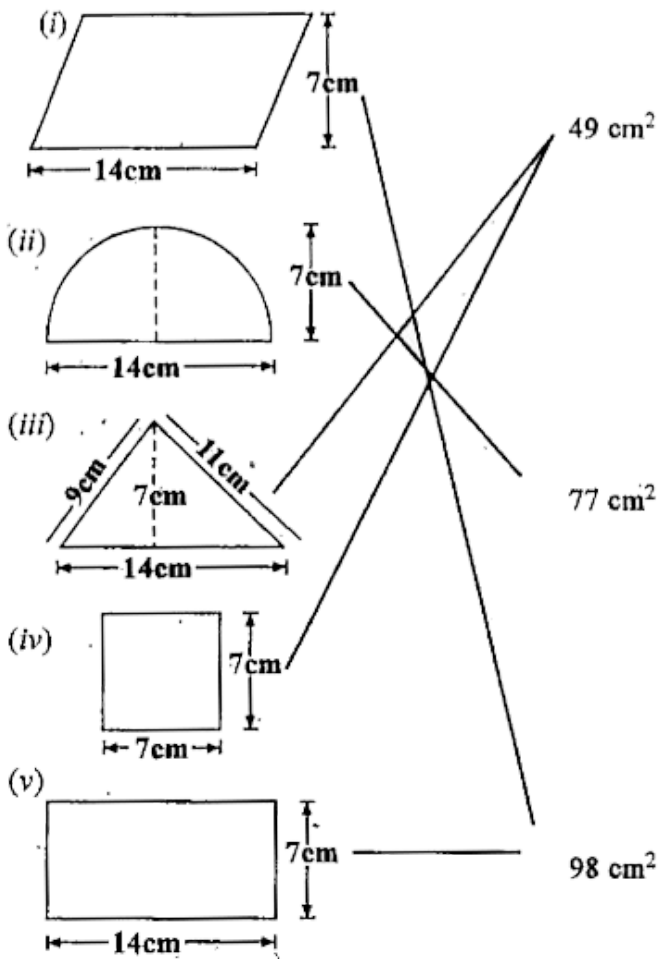




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Try These

1. (a) Match the following figures with their respective areas in the box.



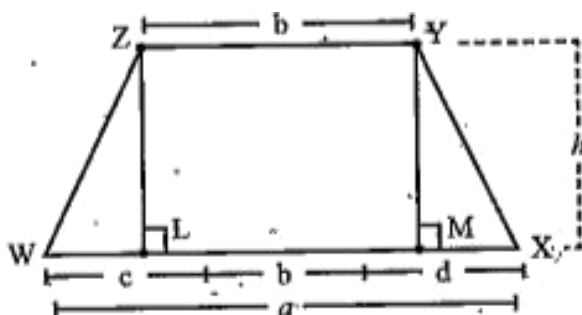
(b) Write the perimeter of each shape.



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2. Nazma's sister also has a trapezium shaped plot. Divide it into three parts as shown (fig. 11.4). Show that the area of trapezium WXYZ

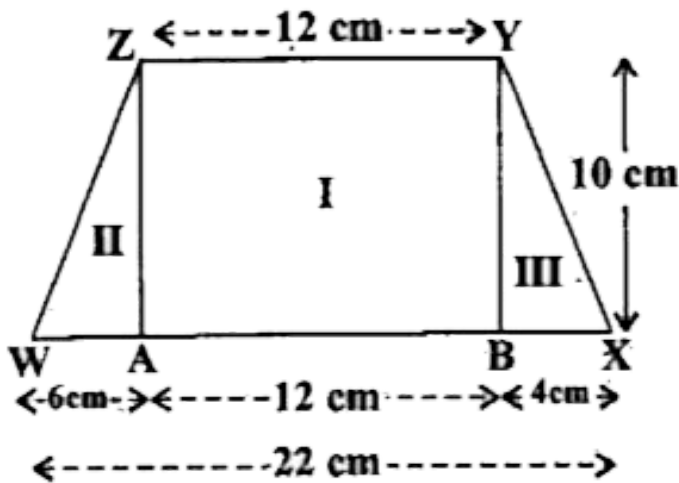
$$= \frac{h(a + b)}{2}$$



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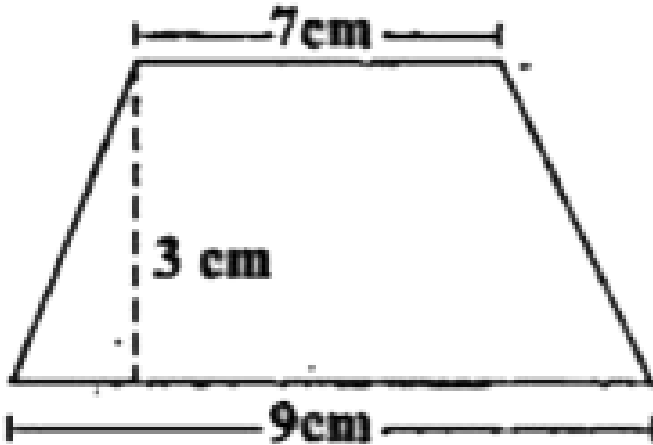
3. If $h = 10$ cm, $c = 6$ cm, $b = 12$ cm, $d = 4$ cm, find the values of each of its parts separately and add to find the area WXYZ. Verify it by putting the values of h , a and b in the expression

$$\frac{h(a + b)}{2}$$



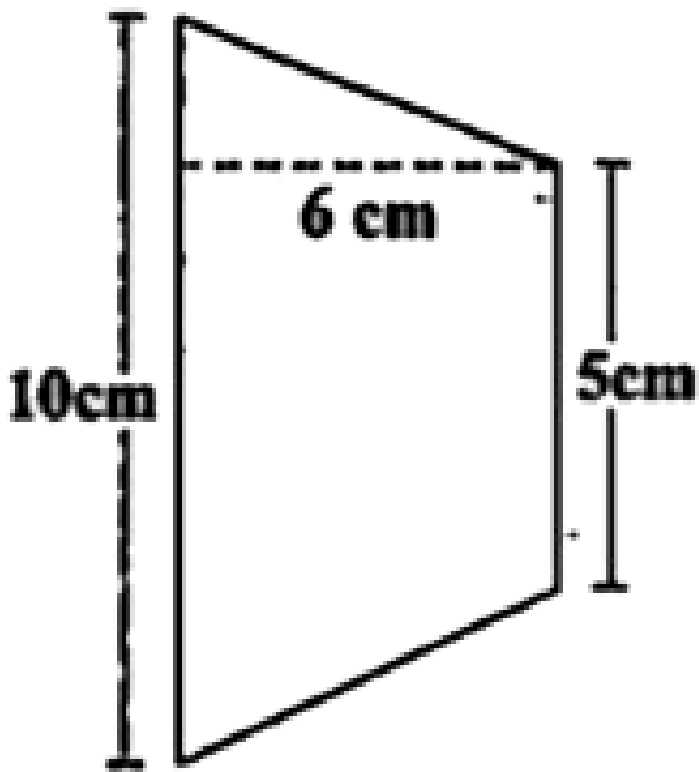
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4. Find the area of the following figure trapezium (Fig.):

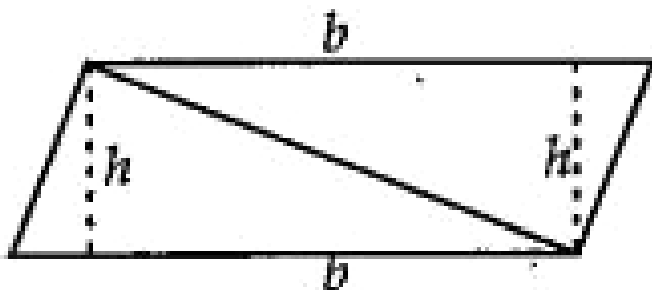


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5. Find the area of the following figure trapezium (Fig.):



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6.

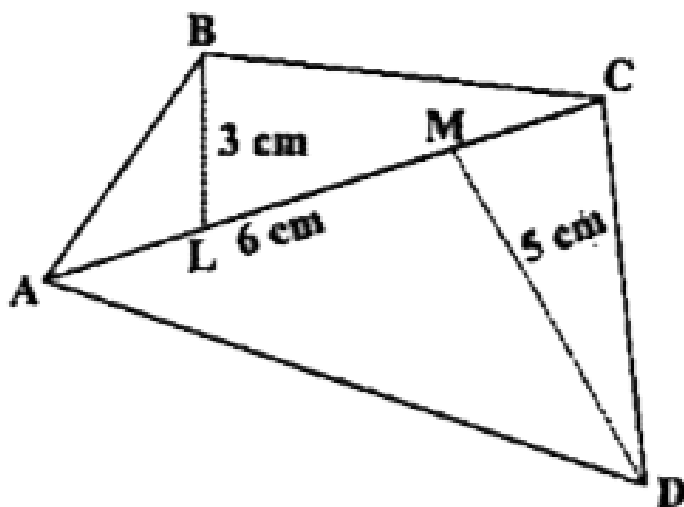
We know that parallelogram is also a quadrilateral. Let us also split such a quadrilateral into two triangles. Find their areas and hence that of the parallelogram. Does this agree with the formula that you know already?



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7. Find the area of the following quadrilaterals

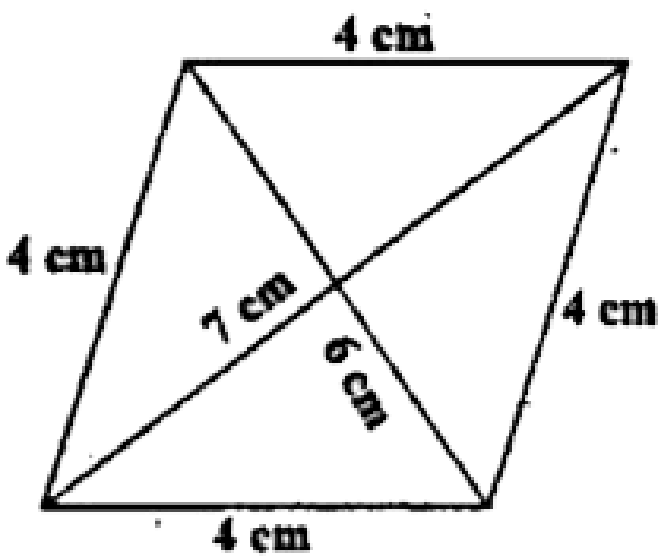
(Fig.)



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8. Find the area of the following quadrilaterals

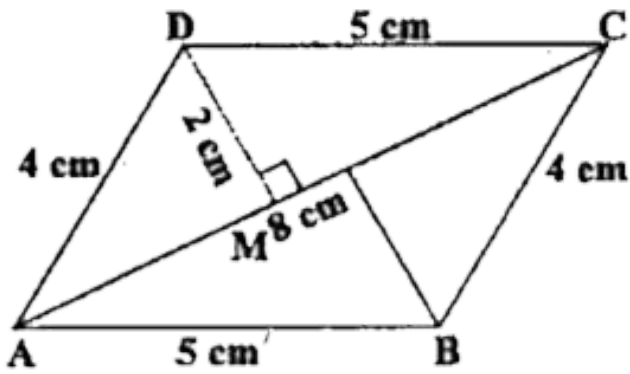
(Fig.)



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9. Find the area of the following quadrilaterals

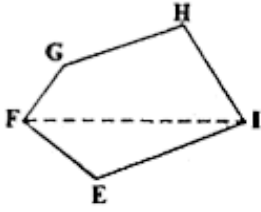
(Fig.)



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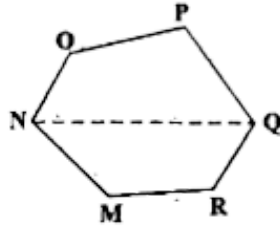
10. Divide the following polygons (Fig.) into parts (triangles and trapezium) to find out the

area.

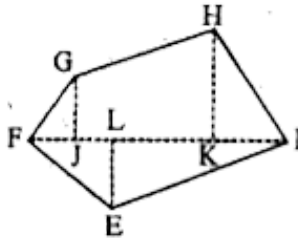


FI is the diagonal of polygon EFGHI

Sol.



NQ is a diagonal of polygon MNOPQR



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

perpendiculars $BF=2$ cm, $CH=3$ cm, $EG=2.5$ cm.

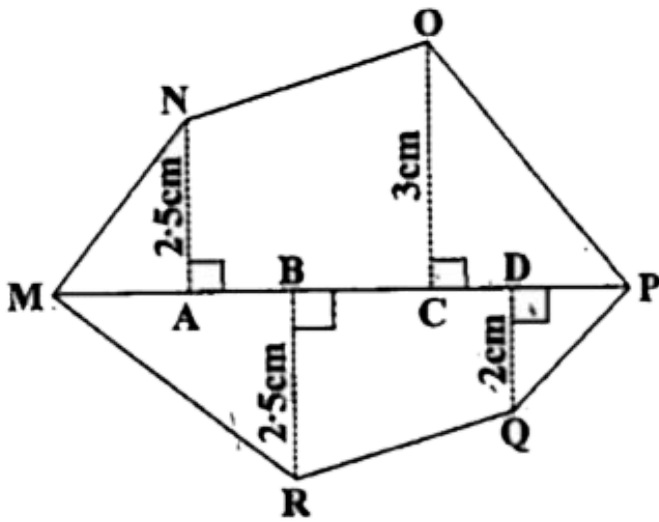


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12. Find the area of polygon $MNOPQR$ (Fig.) if

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

cm

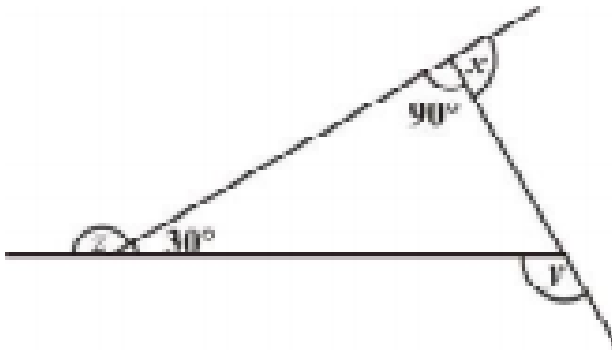


NA , OC , QD and RB are perpendiculars to diagonal MP .



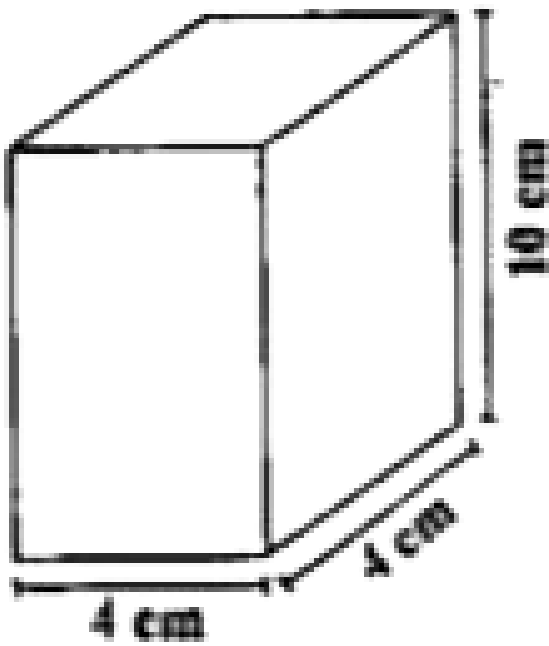
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13. Find $x+y+z$



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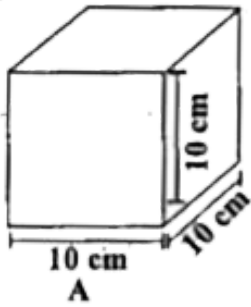
14. Find the total surface area of the following cuboids:



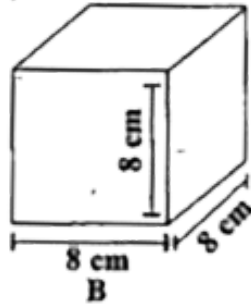
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15. Find the surface area of cube A and surface area of cube B (Fig.)

(i)



(ii)



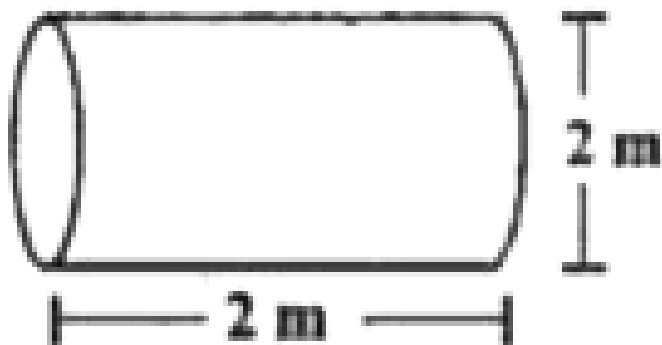
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16. Find total surface area of the following cylinders (Fig).



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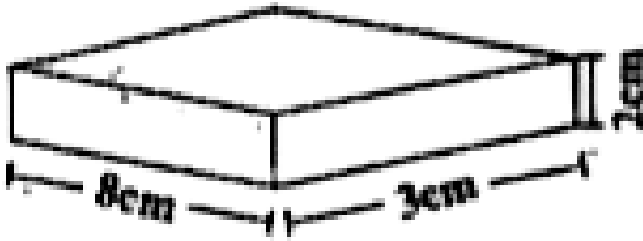
17. Find total surface area of the following cylinders (Fig).



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18. Find the volume of the following cuboids

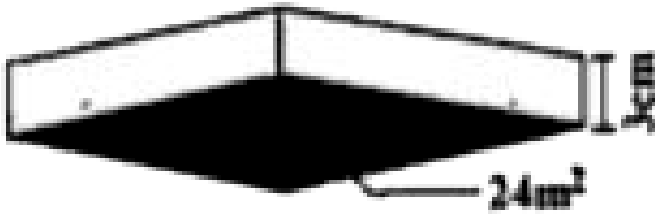
(Fig.).



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19. Find the volume of the following cuboids

(Fig.).



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20. Find the volume of the following cubes:

with a side 4 cm

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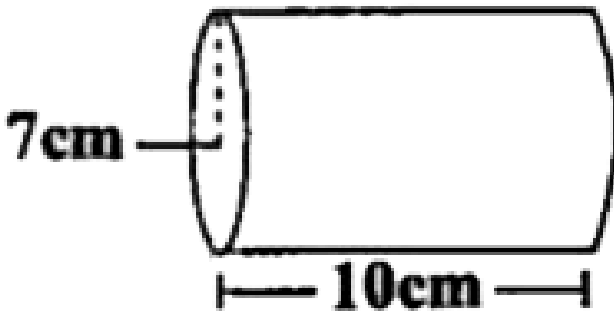
21. Find the volume of the following cubes:

with a side 1.5 m



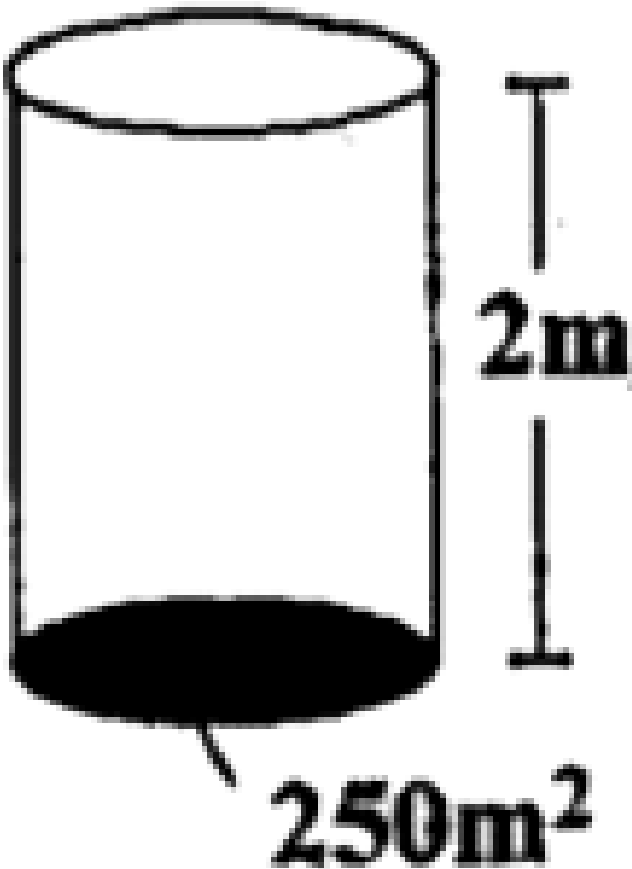
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22. Find the volume of the following cylinders



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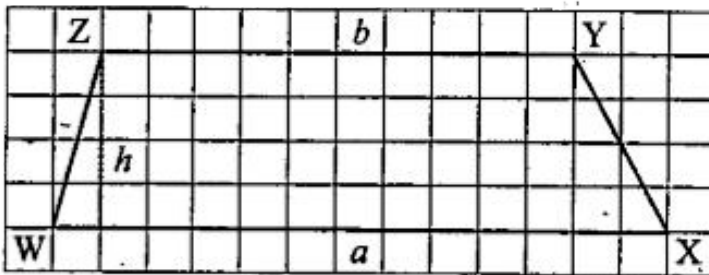
23. Find the volume of the following cylinders



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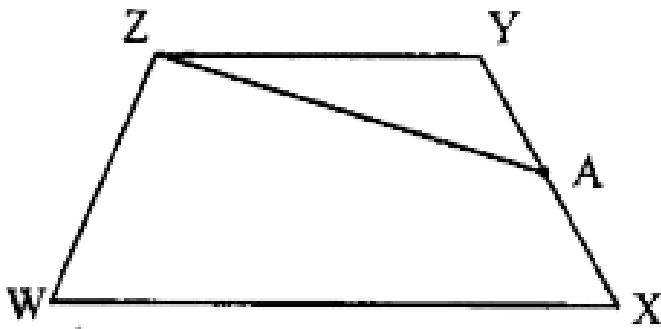
Do This

1. Draw any trapezium $WXYZ$ on a piece of graph paper as shown in the fig. and cut it out.



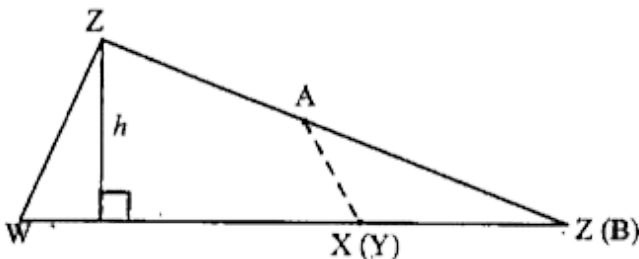
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2. Find the mid point of XY by folding the side and name it A . (see adjoining figure)



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3. Cut trapezium $WXYZ$ into two pieces by cutting along ZA . Place $\triangle ZYA$ as shown in figure below, where AY is placed on AX .



What is the length of the base of the larger triangle ? Write an expression for the area of this triangle. (see figure above)



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4. The area of this triangle and the area of the trapezium WXYZ are same (How ?). Get the expression for the area of trapezium by using the expression for the area of triangle.



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5. For the following data, draw a frequency polygon

Marks	Number of Students
0-10	5
10-20	10
20-30	8
30-40	5
40-50	2
Total	30



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6. Arrange 64 cubes of equal size in as many ways as you can to form a cuboid. Find the surface area of each arrangement. Can solid shapes of same volume have same surface area?



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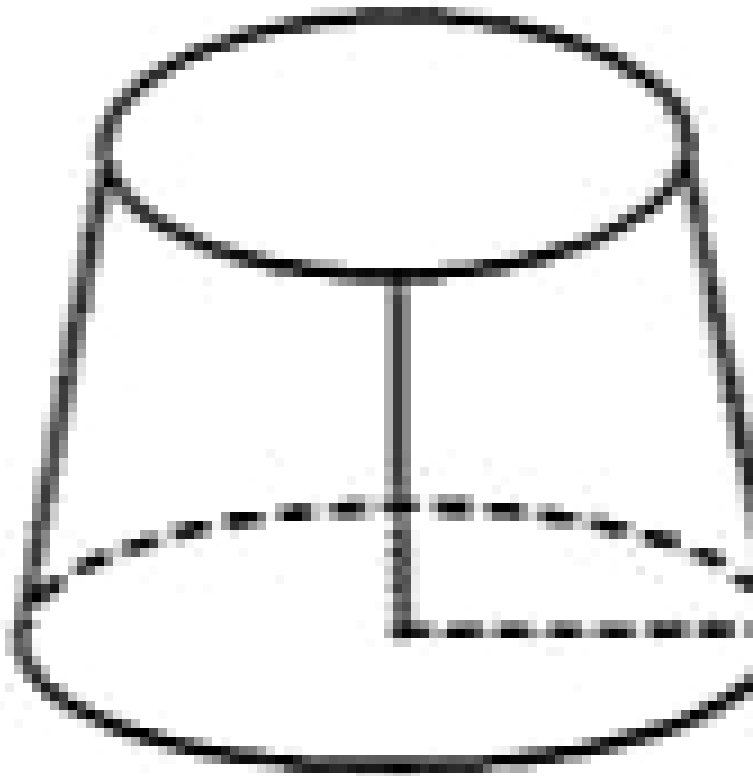
Think Discuss And Write

1. A parallelogram is divided into two congruent triangles by drawing a diagonal across it. Can we divide a trapezium into two congruent triangles?



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2. Why is it incorrect to call the solid shown here a cylinder?



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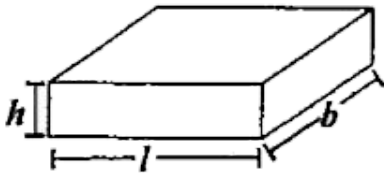
3. Can we say that total surface area of cuboid
= lateral surface area + $2 \times$ area of base?



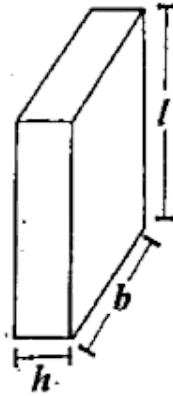
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4. If we interchange the lengths of the base and the height of a cuboid [Fig. (i)] to get another cuboid [Fig. (ii)], will its lateral surface

area change?



(i)



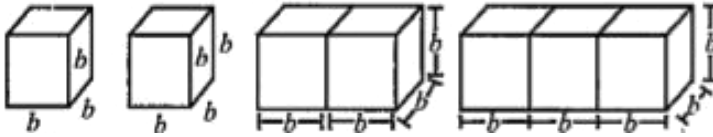
(ii)



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5. Two cubes each with side 'b' are joined to form a cuboid. What is the surface area of this cuboid? It is $12b^2$? Is the surface area of cuboid formed by joining three such cubes

$18b^2$? Why?



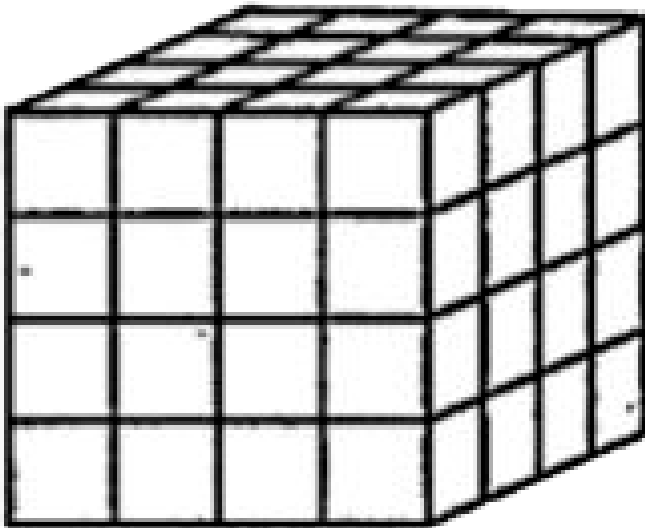
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6. How will you arrange 12 cubes of equal length to form a cuboid of smallest surface area?



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7. After the surface area of a cube is painted, the cube is cut into 64 smaller cubes of same dimensions (Fig.), How many have no face painted ? 1.face painted ? 2 faces painted ? 3 faces painted ?



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8. Note that lateral surface area of a cylinder is the circumference of base \times height of cylinder. Can we write lateral surface of a cuboid as perimeter of base \times height of cuboid?



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9. A company sells biscuits. For packing purpose they are using cuboidal boxes : box

$A \rightarrow 3cm \times 8cm \times 20cm,$

box

$B \rightarrow 4\text{cm} \times 12\text{cm} \times 10\text{cm}$. What size of the box will be economical for the company? Why? Can you suggest any other size dimensions which has the same volume but is more economical than these?



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Exercise 11 1

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

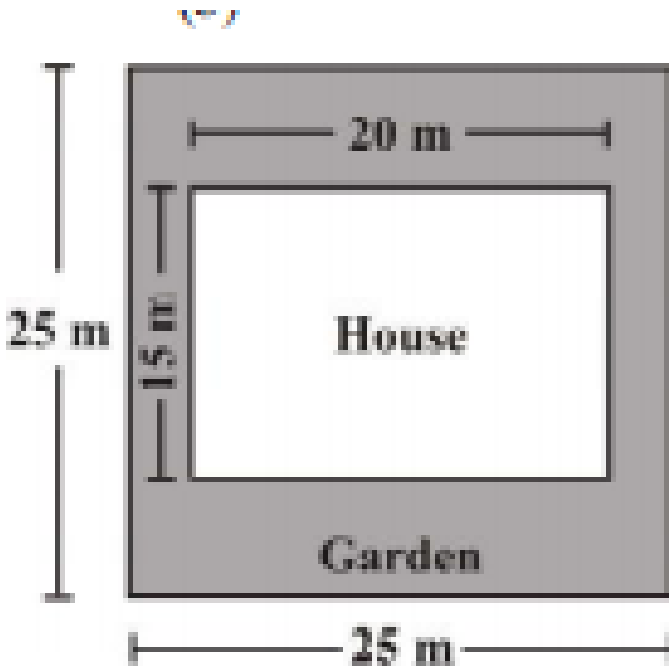
same perimeter. Which field has a larger area ?



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2. Mrs. Kaushik has a square plot with the B measurement 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

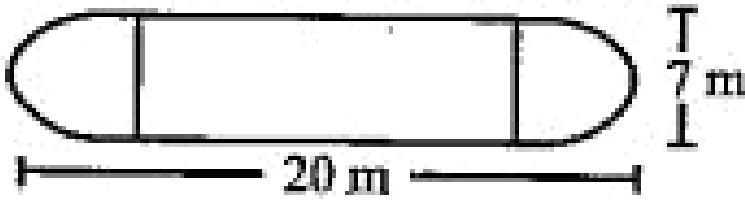
Rs55perm².



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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 $20 - (3.5 + 3.5)$ meter).



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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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Exercise 11 2

1. 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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2. The area of a trapezium is 34cm^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 $BC=48\text{m}$, $CD = 17\text{ m}$ 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 $10,500 \text{ cm}^2$ and the perpendicular

distance between the two parallel sides is 100m, find the length of the side along the river.



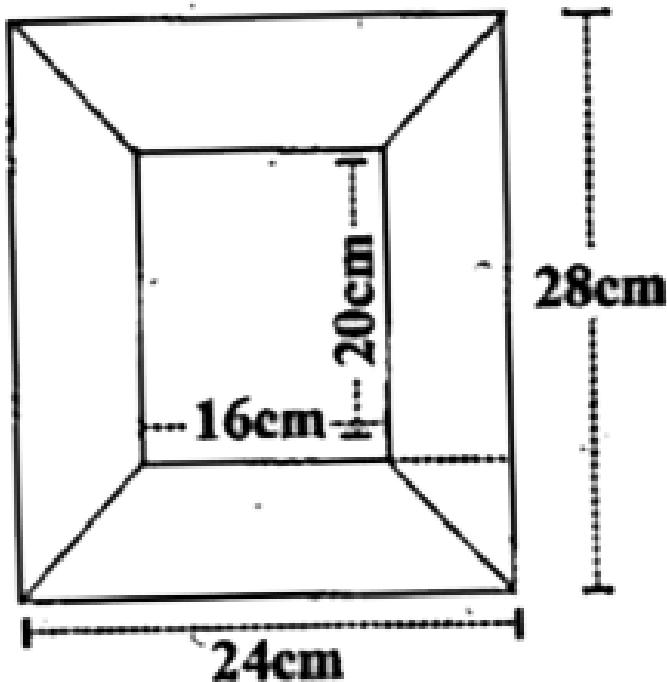
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9. Top surface of a raised platform is in the shape of a regular octagon as shown in the figure. Find the area of the octagonal surface.



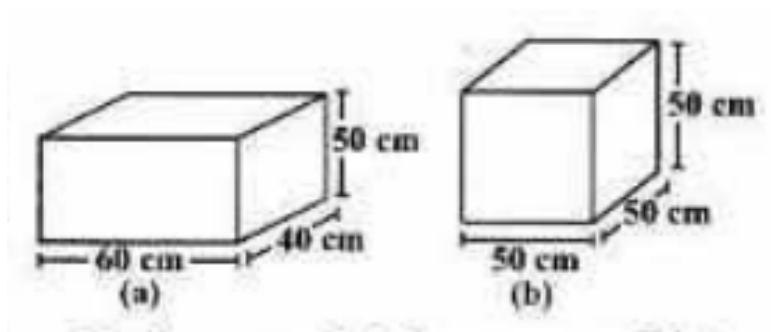
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10. Diagram of the adjacent picture frame has outer dimensions = 24 cm \times 28 cm and inner dimensions 16 cm \times 20 cm. Find the area of each section of the frame, if the width of each section is same.



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?



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



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



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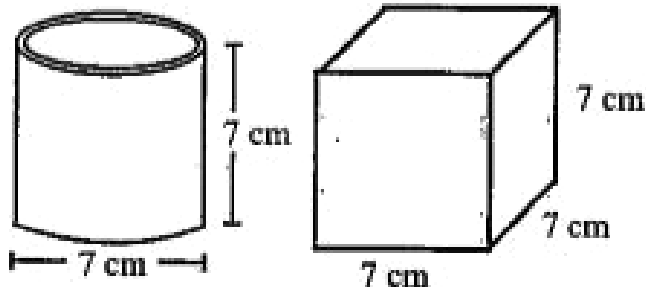
5. Daniel is painting the walls and ceiling of a cuboidal hall with length, breadth and height of 15 m, 10 m and 7 m respectively. From each can of paint $100m^2$ of area is painted. How

many cans of paint will she need to paint the room?



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6. Describe how the two figures at the right are alike and how they are different. Which box has larger 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 4224cm^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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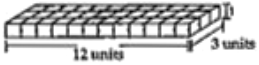
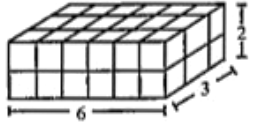
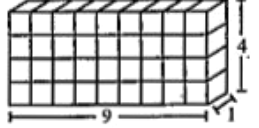
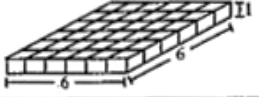
10. A company packages its milk powder in cylindrical container whose base has a diameter of 14 cm and height 20 cm. Company

places a label around the surface of the container (as shown in the figure). If the label is placed 2 cm from top and bottom, what is the area of the label?



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11. Take 36 cubes of equal sizes (i.e., length of each cube is same). Arrange them to form a cuboid. You can arrange them in many ways. Observe the following table and fill in the blanks.

	Cuboid	Length	Breadth	Height	$l \times b \times h = V$
(i)		12	3	1	$12 \times 3 \times 1 = 36$
(ii)		6
(iii)	
(iv)	

What do you observe?



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Exercise 11 4

1. 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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2. 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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3. 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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4. 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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5. Find the height of a cuboid whose base area is 180cm^2 and volume is 900cm^3 ?



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6. 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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7. Find the height of the cylinder whose volume is 1.54m^3 and diameter of the base is 140 cm ?



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8. 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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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 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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