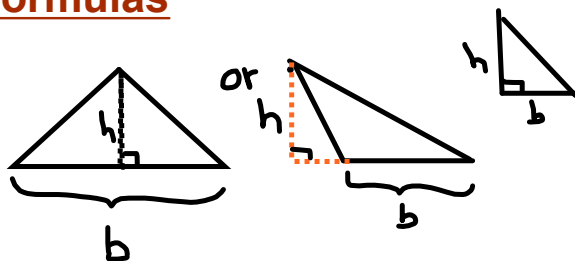


Gr 8

Review of important formulas

Lesson 1

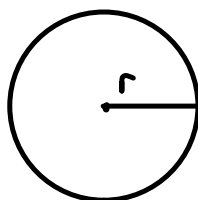
Area of a triangle = $\frac{\text{base} \times \text{height}}{2}$



Area of a rectangle = Length x Width



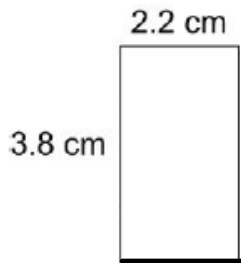
Area of a circle = πr^2
= $3.14 \times r \times r$



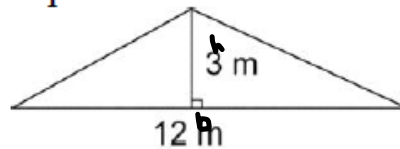
Review of Area of rectangle, triangles & circles Area of Two-Dimensional Shapes

1) Find the area of each shape.

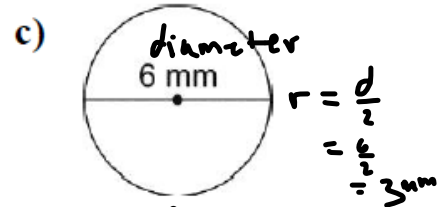
a) b)



$$\begin{aligned} A &= l \times w \\ &= 3.8 \text{ cm} \times 2.2 \text{ cm} \\ &= 8.32 \text{ cm}^2 \end{aligned}$$



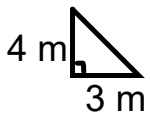
$$\begin{aligned} A &= \frac{b \times h}{2} \\ &= \frac{12 \text{ m} \times 3 \text{ m}}{2} \\ &= \frac{36 \text{ m}^2}{2} \\ &= 18 \text{ m}^2 \end{aligned}$$



$$\begin{aligned} A &= \pi r^2 \\ &= 3.14 \times (3 \text{ mm})^2 \\ &= 3.14 \times (9 \text{ mm}^2) \\ &= 28.26 \text{ mm}^2 \end{aligned}$$

2) Find the area of the each shape and sketch the shape.

a. A triangle with height 3 m and base 4 m



$$A = \frac{b \times h}{2}$$

$$= \frac{4 \text{ m} \times 3 \text{ m}}{2}$$

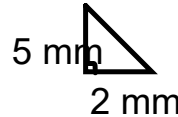
2

$$= \frac{12 \text{ m}^2}{2}$$

2

$$= 6 \text{ m}^2$$

b. A triangle with height 2 mm and base 5 mm



$$A = \frac{b \times h}{2}$$

$$= \frac{2 \text{ mm} \times 5 \text{ mm}}{2}$$

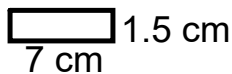
2

$$= \frac{10 \text{ mm}^2}{2}$$

2

$$= 5 \text{ mm}^2$$

c. A rectangle with length 7 cm and width 1.5 cm

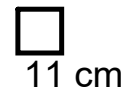


$$A = l \times w$$

$$= 7 \text{ cm} \times 1.5 \text{ cm}$$

$$= 10.5 \text{ cm}^2$$

d. A square with side length 11 cm

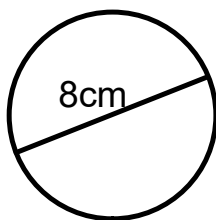


$$A = l \times w$$

$$= 11 \text{ cm} \times 11 \text{ cm}$$

$$= 121 \text{ cm}^2$$

e. A circle with diameter 8 cm



$$A = \pi r^2$$

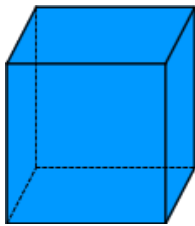
$$= 3.14 \times (8 \text{ cm})^2$$

$$= 3.14 \times (64 \text{ cm}^2)$$

$$= 200.96 \text{ cm}^2$$

Surface Area of Right Rectangular Prisms

Surface Area is the sum of the area of all the faces of a 3D object.

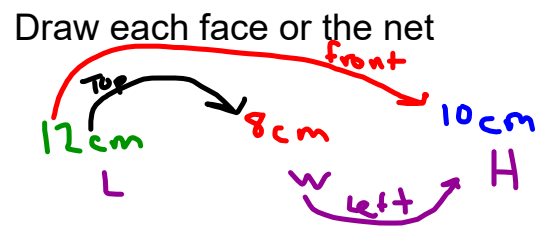
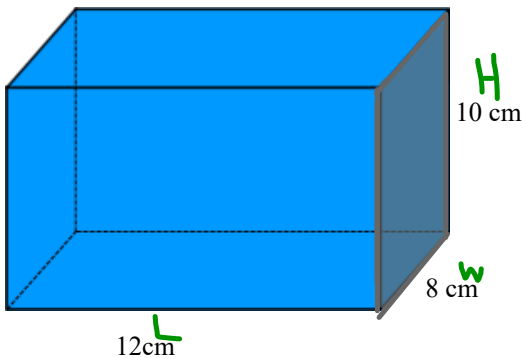


Square units (for example: m^2 , cm^2) are used to measure area and surface area and **MUST** be included!

How to Find Surface Area of 3D Objects

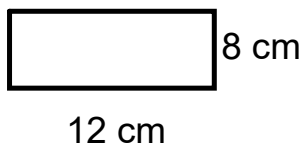
To find surface area:

1. Draw all of the faces (or you can draw a net).
2. Find the area of each face.
3. Then add up the areas of all of the faces.



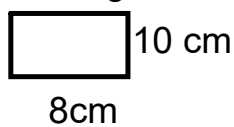
Faces

Front/back



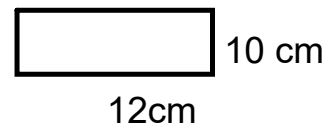
$$\begin{aligned} A &= l \times w \\ &= 12 \text{ cm} \times 8 \text{ cm} \\ &= 96 \text{ cm}^2 \end{aligned}$$

Left/Right



$$\begin{aligned} A &= l \times w \\ &= 8 \text{ cm} \times 10 \text{ cm} \\ &= 80 \text{ cm}^2 \end{aligned}$$

Top/ bottom

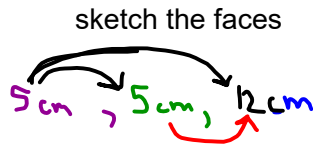
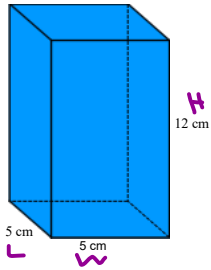


$$\begin{aligned} A &= l \times w \\ &= 12 \text{ cm} \times 10 \\ &= 120 \text{ cm}^2 \end{aligned}$$

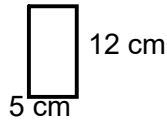
$$\begin{aligned} \text{Total SA}_{\text{rec prism}} &= 2(\text{front}) + 2(\text{side}) + 2(\text{Top}) \\ &= 2(96\text{cm}^2) + 2(80\text{cm}^2) + 2(120\text{cm}^2) \\ &= 192\text{cm}^2 + 160\text{cm}^2 + 240\text{cm}^2 \\ &= 592\text{cm}^2 \end{aligned}$$

gr 8 u4 Area_Volume Prism Lesson 1 Area of Rectangular Prism Elearn Smart Lesson.notebook

What is the surface area of this rectangular prism?

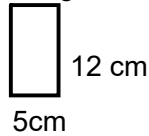


Front/back



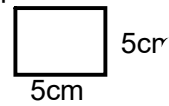
$$\begin{aligned} A &= l \times w \\ &= 5 \text{ cm} \times 12 \text{ cm} \\ &= 60 \text{ cm}^2 \end{aligned}$$

Left/Right



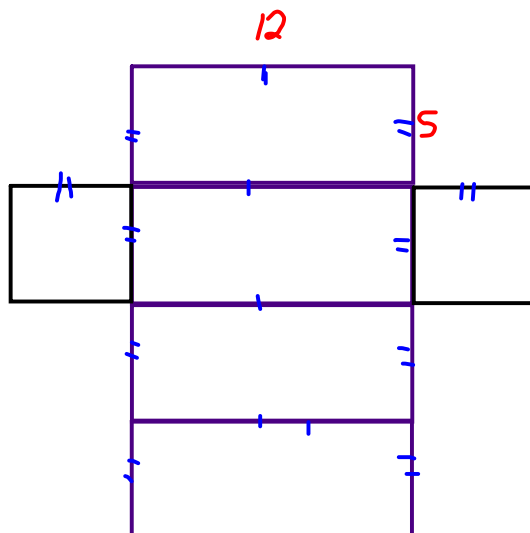
$$\begin{aligned} A &= l \times w \\ &= 5 \text{ cm} \times 12 \text{ cm} \\ &= 60 \text{ cm}^2 \end{aligned}$$

Top/ bottom



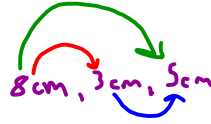
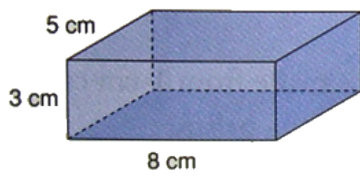
$$\begin{aligned} A &= l \times w \\ &= 5 \text{ cm} \times 5 \text{ cm} \\ &= 25 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Total SA}_{\text{rec prism}} &= 2(\text{front}) + 2(\text{side}) + 2(\text{Top}) \\ &= 2(60\text{cm}^2) + 2(60\text{cm}^2) + 2(25\text{cm}^2) \\ &= 120\text{cm}^2 + 120\text{cm}^2 + 50\text{cm}^2 \\ &= 290\text{cm}^2 \end{aligned}$$



What is the surface area of this prism?

What is the surface area of this rectangular prism?



Front/back



$$\begin{aligned} A &= l \times w \\ &= 8\text{cm} \times 3\text{cm} \\ &= 24\text{cm}^2 \end{aligned}$$

Left/Right



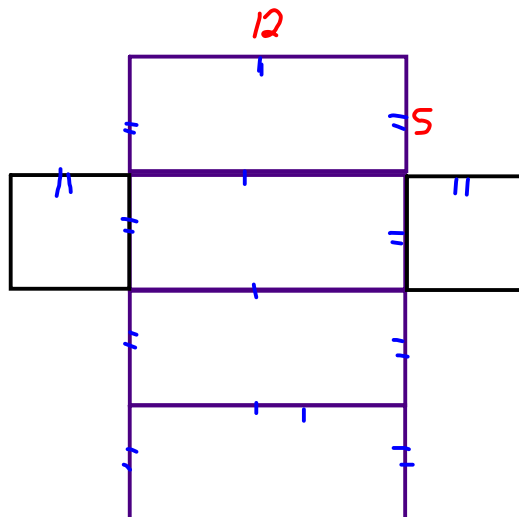
$$\begin{aligned} A &= l \times w \\ &= 3\text{cm} \times 5\text{cm} \\ &= 15\text{cm}^2 \end{aligned}$$

Top/ bottom



$$\begin{aligned} A &= l \times w \\ &= 8\text{cm} \times 5\text{cm} \\ &= 40\text{cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Total SA}_{\text{rec prism}} &= 2(\text{front}) + 2(\text{side}) + 2(\text{Top}) \\ &= 2(24\text{cm}^2) + 2(15\text{cm}^2) + 2(40\text{cm}^2) \\ &= 48\text{cm}^2 + 30\text{cm}^2 + 80\text{cm}^2 \\ &= 158\text{cm}^2 \end{aligned}$$



The surface area of a cube is 96 cm^2 .

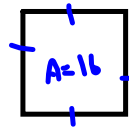
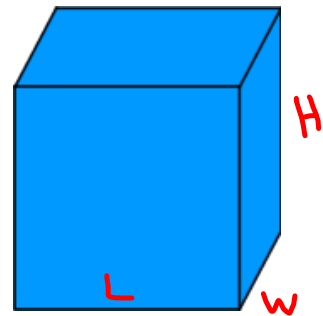
a) What is the area of one face of the cube?
 since all faces are equal then = 6 faces

$$\text{Area}_{\text{cube}} = 6 \times (\text{area of one face})$$

$$96 \text{ cm}^2 = 6 \times (\text{area of one face})$$

$$\frac{96 \text{ cm}^2}{6} = \frac{6 \times (\text{area of one face})}{6}$$

$$\text{Area of one face} = 16 \text{ cm}^2$$



$$A_{\square} = \text{Side} \times \text{side} = \text{side}^2$$

b) What is the length of one edge of the cube?

Since

A of a square = side x side

$$16 \text{ cm}^2 = \text{side} \times \text{side}$$

$$\text{side} = \sqrt{16 \text{ cm}^2}$$

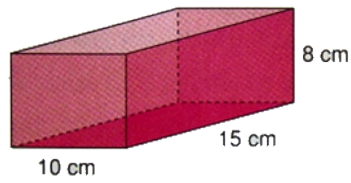
$$\text{side} = 4 \text{ cm}$$

$$\text{Side}_{\square} = \sqrt{\text{Area}}$$

Sketch a the faces of the right rectangular prism.

What is its surface area?

you try and the solution is typed on the next slide



Front/back

Left/Right

Top/ bottom

A =

A =

A =

=

=

=

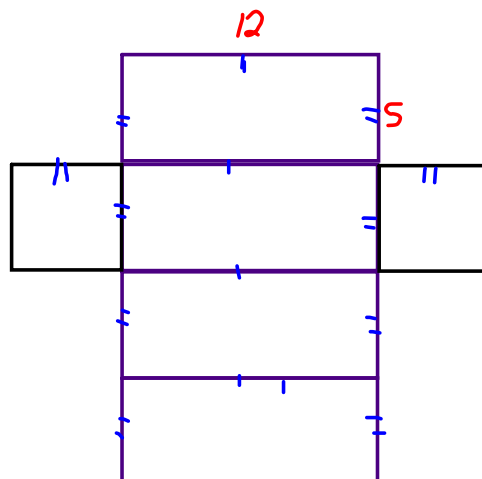
=

Total SA_{rec prism} =

=

=

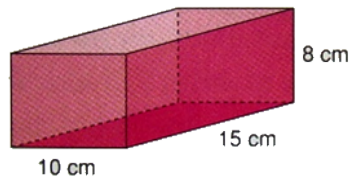
=



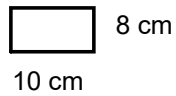
Sketch a the faces of the right rectangular prism.

What is its surface area?

Solution

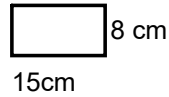


Front/back



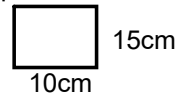
$$\begin{aligned} A &= l \times w \\ &= 10 \text{ cm} \times 8 \text{ cm} \\ &= 80 \text{ cm}^2 \end{aligned}$$

Left/Right



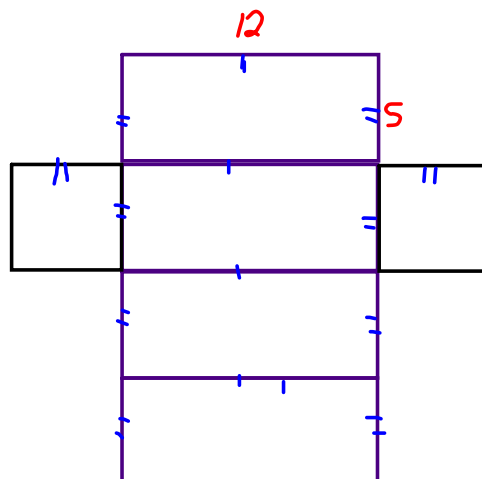
$$\begin{aligned} A &= l \times w \\ &= 15 \text{ cm} \times 8 \text{ cm} \\ &= 120 \text{ cm}^2 \end{aligned}$$

Top/ bottom



$$\begin{aligned} A &= l \times w \\ &= 10 \text{ cm} \times 15 \text{ cm} \\ &= 150 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Total SA}_{\text{rec.prism}} &= 2(\text{front}) + 2(\text{side}) + 2(\text{Top}) \\ &= 2(80\text{cm}^2) + 2(120\text{cm}^2) + 2(150\text{cm}^2) \\ &= 160\text{cm}^2 + 240\text{cm}^2 + 300\text{cm}^2 \\ &= 700\text{cm}^2 \end{aligned}$$

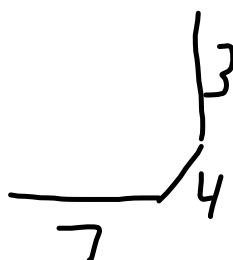


Practice Questions

Page 186 #5, #6ac, 7, 9, 10, 11



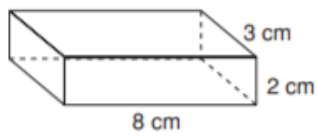
a) Whenever 3 dimensions are given, they are in the order:
length, width and height.



Side Walls }
4x3 }
Back Front }
7x3 }

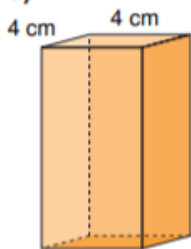
b) don't paint the floor

5. Sketch a net of this right rectangular prism. What is its surface area?

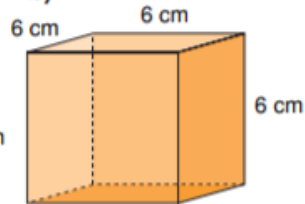


6. Find the surface area of each right rectangular prism.

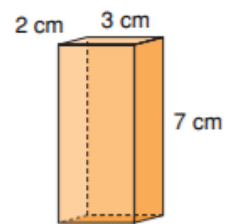
a)



b)



c)



- 7.** Find the surface area of a right rectangular prism with these dimensions.
- a)** 4 m by 3 m by 10 m
 - b)** 3 cm by 5 cm by 8 cm

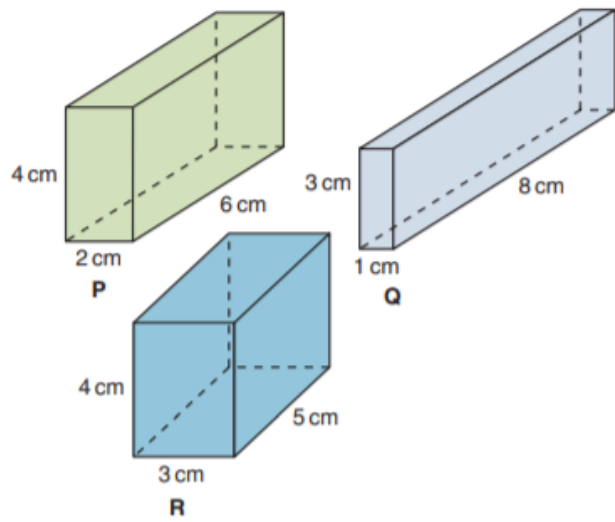
- 9.** Tanya paints the walls of her family room. The room measures 7 m by 4 m by 3 m. The walls need 2 coats of paint. A 4-L can of paint covers 40 m^2 .
- a) How much paint should Tanya buy?
 - b) What assumptions do you make?
Explain.

- 10.** The surface area of a cube is 54 cm^2 .
- What is the area of one face of the cube?
 - What is the length of one edge of the cube?

- 11.** A window washing company is hired to wash the windows in a condominium. The building is 50 m by 30 m by 300 m. Windows cover about one-quarter of the building. What is the total surface area of the windows to be washed? What assumptions do you make?

- 12.** The Sandberg Institute building in Amsterdam generates revenue by selling advertising space on the exterior of the building. The building is a rectangular prism with dimensions 50 m by 40 m by 75 m. Suppose it costs 1 Euro per month to rent an advertising space of 50 cm^2 . Each of the 4 walls of the building is covered with advertisements. How much money will the institute earn in one month?

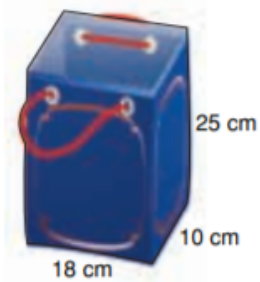
13. Which prism has the greatest surface area? The least surface area?



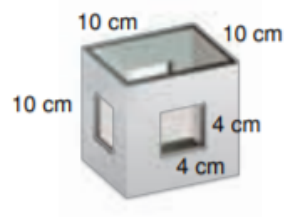
14. **Assessment Focus** Sketch a right rectangular prism. Label its dimensions. Answer the question below. Justify your answer. What do you think happens to the surface area of a prism in each case?
- i) Its length is doubled.
 - ii) Its length is halved.

- 15.** Each object has the shape of a rectangular prism, but one face or parts of faces are missing. Find each surface area.

a)



b)



- 16. Take It Further** A right rectangular prism has a square base with area 4 m^2 . The surface area of the prism is 48 m^2 . What are the dimensions of the prism?

- 17. Take It Further** A right rectangular prism has faces with these areas: 12 cm^2 , 24 cm^2 , and 18 cm^2
What are the dimensions of the prism?
How did you find out?

Attachments

Review of Surface area of 2D Shape Grade 8 Unit 4 PDF.pdf