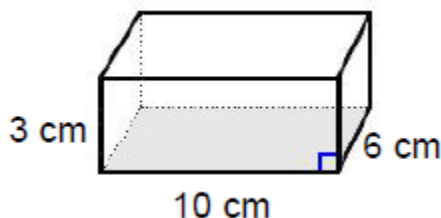


Solving problems of Surface Area

Name: _____ Class: _____

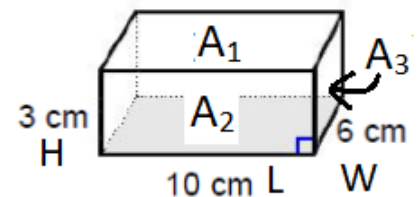
When solving problems that are mathematical, using a standard way will simplify your decisions and make it easier to solve. There are times when you have to be innovative and creative but other times, it is about understanding the problem, planning a strategy (finding a formula), doing the work, checking to see if it is reasonable (review units) and then writing your answer.

Below are two examples of how to lay out your answers. Use this as a guide to writing your answers in this unit.



Given this rectangular prism, we know that there are six sides. In fact, there are 3 pairs of congruent sides and therefore we can find the total surface area by finding the area of three sides and multiplying each by two (or the sum by two).

First label the sides so you can write the following:



$A_T = 2 (A_1 + A_2 + A_3)$ (This means that the total surface area is twice the sum of the three different surface areas)

To the side, we can find the different areas use your new labeled diagram.

$$A_1 = L \times W$$

$$= 10\text{cm} \times 6\text{cm}$$

$$= 60 \text{ cm}^2$$

$$A_2 = L \times H$$

$$= 10\text{cm} \times 3\text{cm}$$

$$= 30 \text{ cm}^2$$

$$A_3 = W \times H$$

$$= 6\text{cm} \times 3\text{cm}$$

$$= 18 \text{ cm}^2$$

Therefore, $A_T = 2 (A_1 + A_2 + A_3)$

$$= 2 (60 \text{ cm}^2 + 30 \text{ cm}^2 + 18 \text{ cm}^2)$$

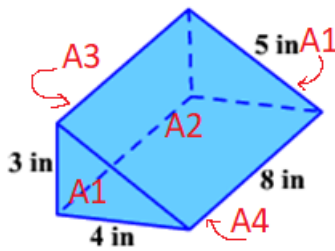
$$= 2(108 \text{ cm}^2)$$

$$= 216 \text{ cm}^2$$

Statement **The total surface area is 216 cm²**

Now practice on the following shapes to get the total surface area.

1.



$$\begin{aligned} AT &= 2A1 + A2 + A3 + A4 \\ &= 2(6\text{in}^2) + (40\text{in}^2) + (24\text{in}^2) + (32\text{in}^2) \\ &= 108\text{in}^2 \end{aligned}$$

$$A1 = \frac{B \times H}{2}$$

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

$$= 12\text{in}^2 / 2$$

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

$$A2 = L \times W$$

$$= 8\text{in} \times 5\text{in}$$

$$= 40\text{in}^2$$

$$A3 = L \times W$$

$$= 8\text{in} \times 3\text{in}$$

$$= 24\text{in}^2$$

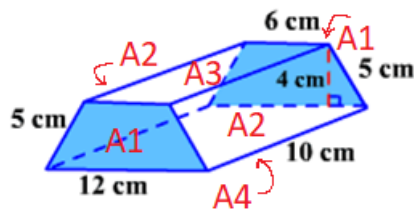
$$A4 = L \times W$$

$$= 8\text{in} \times 4\text{in}$$

$$= 32\text{in}^2$$

Therefore, the total surface area is 108in^2 .

2.



$$\begin{aligned} AT &= 2A1 + 2A2 + A3 + A4 \\ &= 2(36\text{cm}^2) + 2(50\text{cm}^2) + (60\text{cm}^2) + (120\text{cm}^2) \\ &= 72\text{cm}^2 + 100\text{cm}^2 + 60\text{cm}^2 + 120\text{cm}^2 \\ &= 352\text{cm}^2 \end{aligned}$$

$$A1 = \frac{T+B}{2} \times h$$

$$= \frac{6\text{cm} + 12\text{cm}}{2} \times 4\text{cm}$$

$$= \frac{18\text{cm}}{2} \times 4\text{cm}$$

$$= 9\text{cm} \times 4\text{cm}$$

$$= 36\text{cm}^2$$

$$A2 = L \times W$$

$$= 10\text{cm} \times 5\text{cm}$$

$$= 50\text{cm}^2$$

$$A3 = L \times W$$

$$= 10\text{cm} \times 6\text{cm}$$

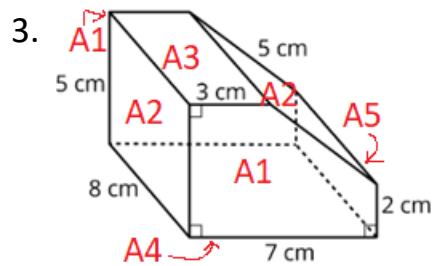
$$= 60\text{cm}^2$$

$$A4 = L \times W$$

$$= 10\text{cm} \times 12\text{cm}$$

$$= 120\text{cm}^2$$

$\therefore$ The total surface area is 352cm^2 .



$$AT = 2A1 + 2A2 + A3 + A4 + A5$$

$$= 2(25\text{cm}^2) + 2(40\text{cm}^2) + 24\text{cm}^2 + 56\text{cm}^2 + 16\text{cm}^2$$

$$= 50\text{cm}^2 + 80\text{cm}^2 + 24\text{cm}^2 + 56\text{cm}^2 + 16\text{cm}^2$$

$$= 226\text{cm}^2$$

$$A1 = \frac{T+B}{2} \times h$$

$$A2 = L \times W$$

$$A3 = L \times W$$

$$A4 = L \times W$$

$$A5 = L \times W$$

$$= \frac{3\text{cm} + 7\text{cm}}{2} \times h$$

$$= 8\text{cm} \times 5\text{cm}$$

$$= 8\text{cm} \times 3\text{cm}$$

$$= 8\text{cm} \times 7\text{cm}$$

$$= 8\text{cm} \times 2\text{cm}$$

$$= \frac{10\text{cm}}{2} \times 5\text{cm}$$

$$= 40\text{cm}^2$$

$$= 24\text{cm}^2$$

$$= 56\text{cm}^2$$

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

$$= 5\text{cm} \times 5\text{cm}$$

$$= 25\text{cm}^2$$

$\therefore$ The total surface area is 226cm^2 .