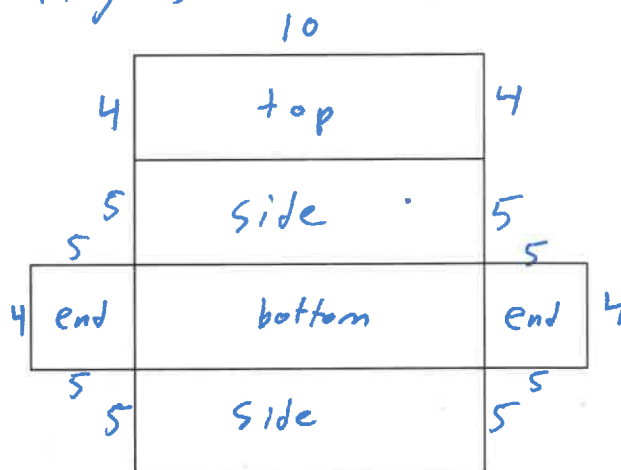
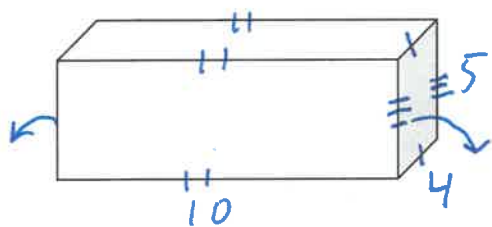


3.2 Surface Area Notes

Surface area the area of all the individual sides of a 3-D shape added together

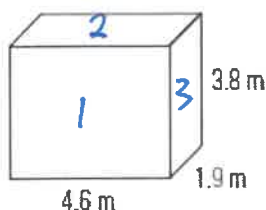
A prism type of 3-D shape 2 identical, parallel sides connected by rectangles

Net of a Rectangular Prism / Cube



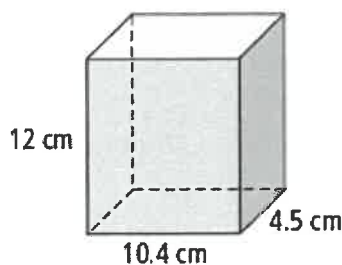
Calculate the surface area.

Ex. 1



$$\begin{aligned}
 SA &= 2LW + 2LW + 2LW \\
 SA &= 2(4.6)(3.8) + 2(4.6)(1.9) + 2(1.9)(3.8) \\
 SA &= 66.88 \text{ m}^2
 \end{aligned}$$

Show you know: Calculate the surface area. Round to the nearest hundredth.

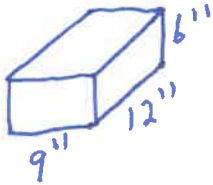


$$\begin{aligned}
 SA &= 2LW + 2LW + 2LW \\
 SA &= 2(10.4)(4.5) + 2(4.5 \times 12) + 2(12 \times 10.4) \\
 SA &= 451.2 \text{ cm}^2
 \end{aligned}$$

Word Problems

Ex 2.

John has been hired to make a jewellery box. If the box is 12 inches long, 6 inches deep and 9 inches tall, how much veneer will it take to cover the exterior, assuming no waste?



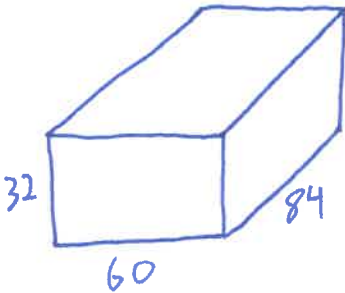
$$SA = 2LW + 2LW + 2LW$$

$$SA = 2(9 \times 12) + 2(12 \times 6) + 2(6 \times 9)$$

$$SA = 468 \text{ in}^2$$

Show you know

Sam wants to send a present to his mother but can't find a box big enough so he is going to build one out of cardboard sheets. He figures he will need a box 60" x 32" x 84". How much cardboard will he need?

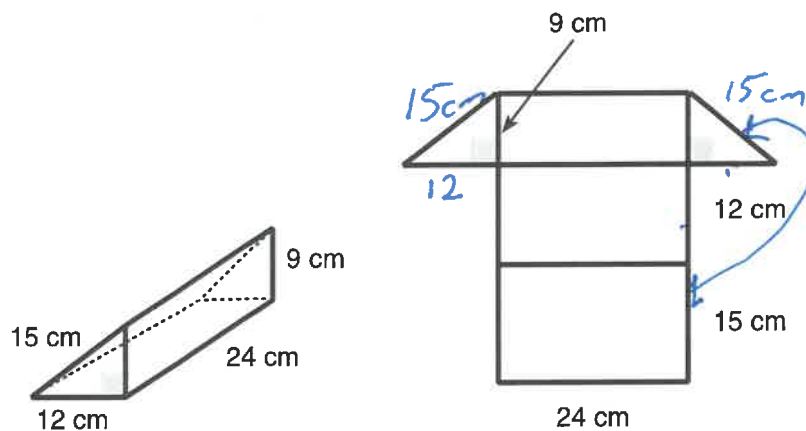


$$SA = 2LW + 2LW + 2LW$$

$$SA = 2(60 \times 32) + 2(32 \times 84) + 2(60 \times 84)$$

$$SA = 19,296 \text{ in}^2$$

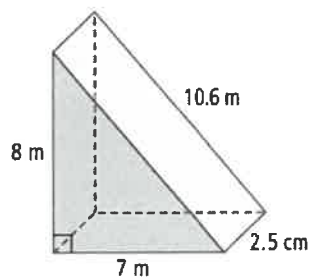
Net of a Triangular Prism



Surface area:

$$SA = bh + Lw + Lw + Lw$$

Ex 2. Calculate the surface area.

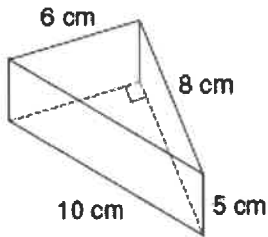


$$SA = bh + Lw + Lw + Lw$$

$$SA = (7)(8) + (2.5)(10.6) + (2.5)(7) + (2.5)(8)$$

$$SA = 120m^2$$

Show you know:

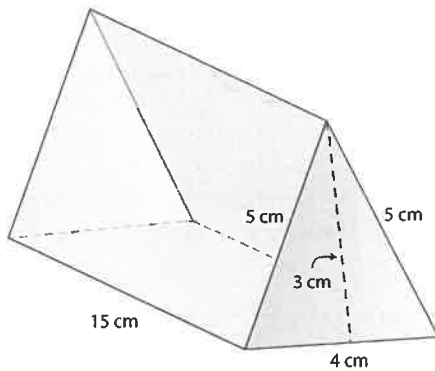


$$SA = Lw + Lw + Lw + bh$$

$$SA = (10 \times 5) + (8 \times 5) + (6 \times 5) + (6 \times 8)$$

$$SA = 168 \text{ cm}^2$$

Ex 3.



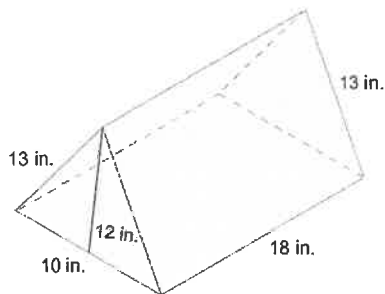
$$\text{or } SA = 2Lw + Lw + bh$$

$$SA = Lw + Lw + Lw + bh$$

$$SA = (5 \times 15) + (5 \times 15) + (4 \times 15) + (4 \times 3)$$

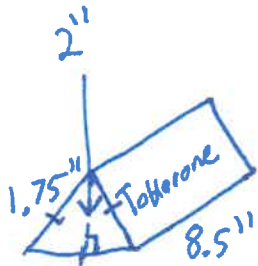
$$SA = 222 \text{ cm}^2$$

Show you know



Word Problem

Toblerone come in a triangular prism shaped box. The box is $8\frac{1}{2}$ " long and the ends are equilateral triangles with sides measuring $1\frac{3}{4}$ ". The height of the triangle is 2". What is the surface area of the box?



$$SA = LW + LW + LW + bh$$

$$SA = (8.5 \times 1.75) + (8.5 \times 1.75) + (8.5 \times 1.75) + (1.75 \times 2)$$

$$SA = 3 \times (8.5 \times 1.75) + (1.75 \times 2)$$

$$SA = 48.125 \text{ in}^2$$

Ex 2.

Bob is tiling his shower. He wants to calculate how much tile he will need so he doesn't waste any money. The shower measures 36" W x 48" L x 72" H.

a. What is the surface area of the shower that will be tiled?



$$SA = 2LW + \cancel{LW} + \cancel{LW}$$

$$SA = 2(48 \times 72) + (36 \times 72) + (36 \times 48)$$

$$SA = 11,232 \text{ in}^2$$

3 sides and bottom

b. If 1 box of tile covers 900 in^2 . How many boxes will he need to buy?

$$\frac{1 \text{ box}}{900 \text{ in}^2} = \frac{x}{11,232}$$

$$x = 12.48 = 13 \text{ boxes}$$

c. If 1 box costs \$165, what is the total cost of the tile?

$$\frac{1 \text{ box}}{\$165} = \frac{13}{x}$$

$$x = \$2145$$

1. Bob is painting his bedroom. He will need 2 coats as he is changing the colour. His room measures 12' x 14' with 8' walls. He will paint the ceiling the same colour as the walls. He has a door that is 84" by 36" and 1 window that is 48" by 48".

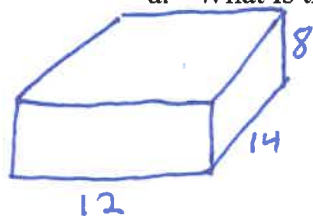
$$\div 12 \quad \div 12$$

$$7 \text{ by } 3$$

$$\div 12 \quad \div 12$$

$$4 \text{ by } 4$$

- a. What is the total square footage that needs to be painted?



$$\begin{aligned} SA &= \text{Ceiling} + 2 \text{ walls} + 2 \text{ walls} \\ &= LW + 2LW + 2LW \\ &= (12 \times 14) + 2(14 \times 8) + 2(12 \times 8) \\ &= 168 + 224 + 196 \end{aligned}$$

$$SA = 584 \text{ ft}^2$$

$$A = L \times W$$

$$A_d = 7 \times 3 = 21 \text{ ft}^2$$

$$A_w = 4 \times 4 = 16 \text{ ft}^2$$

$$\underline{37 \text{ ft}^2}$$

$$584 \text{ ft}^2 - 37 \text{ ft}^2 = \underline{547 \text{ ft}^2}$$

- b. If 1 gallon of paint covers 150 square feet how many gallons does he need?

$$\frac{1g}{150} = \frac{x}{(547 \times 2) \rightarrow (1094)}$$

$$x = 7.29 \rightarrow 8 \text{ gallons}$$

- c. If paint costs \$75/gallon, how much will it cost him to paint his room?

$$\frac{\$75}{1g} = \frac{x}{8g}$$

$$x = \$600.00$$