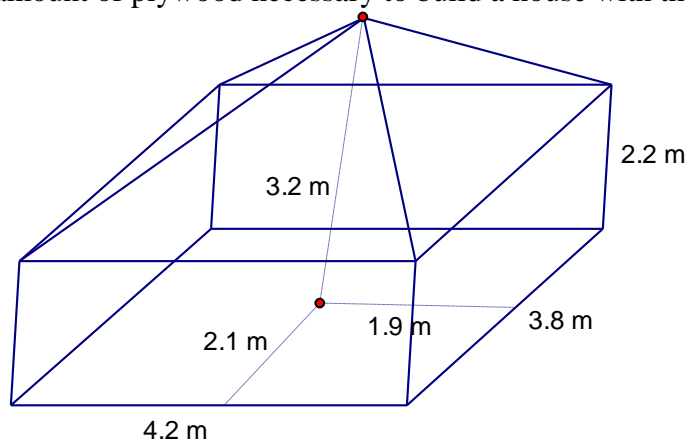


Course: MFM2P Gr. 10 AppliedLesson: 8 - 6Unit: Volume and Surface AreaTopic: Problems with Volume and Surface Area✚ *homework check:* Lesson 8 - 5✚ *note:* Problems with Volume and Surface Area

When we are asked to solve problems, it may be necessary to break a three dimensional shape into manageable pieces. For instance some houses might be broken into two pieces: a rectangular prism and a triangular prism. Some houses might be broken into two different pieces like a rectangular based pyramid and a rectangular prism. For example,

a) find the amount of plywood necessary to build a house with the given dimensions.



$$\text{height of roof} = 3.2 - 2.2$$

$$= 1.0m$$

$$\text{slant of front facing roof} = \sqrt{2.1^2 + 1^2}$$

$$= 2.3m$$

$$\text{slant of side facing roof} = \sqrt{1.9^2 + 1^2}$$

$$= 2.1m$$

To find the total surface area of the roof, we have to add the areas of two front facing and two side facing pieces each of the same dimensions. To find the total surface area of the base of the house, we have to add four sides (two pairs the same) and one bottom together.

ROOF:**Front facing pieces:**

$$SA_{front} = 2 \left(\frac{4.2(2.3)}{2} \right)$$

$$= 9.66m^2$$

Side facing pieces:

$$SA_{side} = 2 \left(\frac{3.8(2.1)}{2} \right)$$

$$= 7.98m^2$$

Total Area of Roof:

$$9.66 + 7.98 =$$

$$= 17.64m^2$$

BASE:**Front side** $\times 2 =$

$$4.2(2.2) \times 2 = 18.48m^2$$

Right side $\times 2 =$

$$3.8(2.2) \times 2 = 16.72m^2$$

Bottom:

$$4.2(3.8) = 15.96m^2$$

Total Area of Base:

$$18.48 + 16.72 + 15.96 = 51.16m^2$$

House Surface Area Total:

$$51.16 + 17.64 = 68.8m^2$$

- b) If plywood comes in a 1.2192m by 2.4384m sheet (4'x8') costs \$11.88 per sheet, how much does it cost to sheet this house?

$$1.2192 \times 2.4384 = 2.9728973m^2$$

$$\frac{68.8}{2.9728973} =$$

$$= 23.14$$

$$\doteq 24$$

$$\text{cost} = 24 \times 11.88$$

$$= \$285.12$$

✚ **homework assignment: Lesson 8 - 6**

Lesson 8 – 6: Problems with Volume and Surface Area

1. A storage silo in the shape of a cylinder with a half sphere top has a height of 35 ft. and a circumference of 22 ft.

a) Find the radius of the silo.

b) Find the height of the cylindrical portion of the silo.

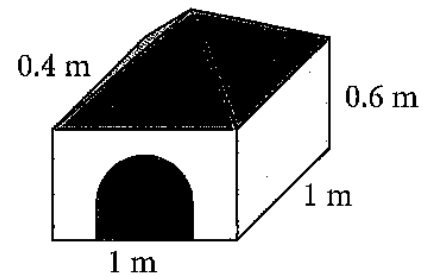
c) Find the volume of the cylindrical portion of the silo.

d) Find the volume of the spherical portion of the silo.

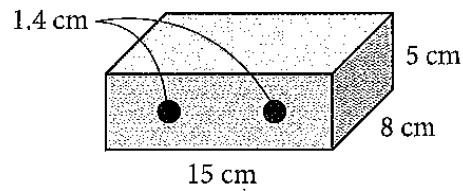
e) What is the total volume of the silo?



2. Find the total surface area of the dog house shown if the doorway is 0.2m^2 .



3. Mack is making a child's toy car from a rectangular piece of wood. He drills two holes each with diameter 1.4 cm, through the block for axles to support the wheels.

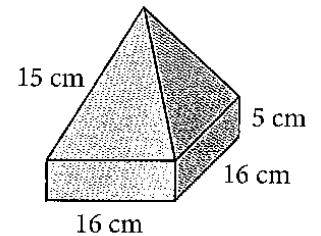


a) What is the volume of the block of wood before the holes are drilled?

b) What is the volume of wood that remains after the holes are drilled?

4. Keith is packaging a toque and glove together as a gift in the container shown.

a) What is the volume of the container if the pyramid is 10.2 cm high.



b) Calculate the surface area of the package.