

[4] 1. Convert the following. Round to two decimal places where necessary.

a) $3.5 \text{ L} = \underline{\hspace{2cm}} \text{ gal}$

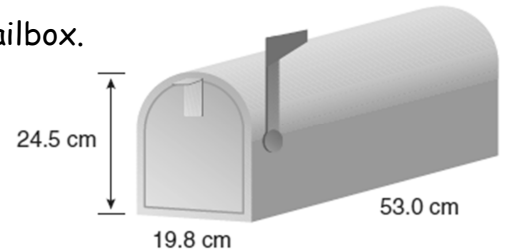
b) $40 \text{ in}^2 = \underline{\hspace{2cm}} \text{ cm}^2$

c) $15 \text{ ft} = \underline{\hspace{2cm}} \text{ m}$

d) $80 \text{ cm}^3 = \underline{\hspace{2cm}} \text{ in}^3$

[6] 2. a) Determine the **volume** of the following mailbox.

b) Determine the **surface area** of the following mailbox.



[4] 3. A farmer needs to fence a rectangular area of 1600 square feet.

a) Determine the dimensions of the rectangular pen that requires the **minimum amount of fencing**.

b) What amount of fencing will he require to create the pen?

[6] 4. A lifeguard is roping off a rectangular swimming area using the beach as one side. She has 800 m of rope.

a) Determine the dimensions that provide the greatest possible area.

b) Is the area in part (a) greater or less than 200 000 square feet? Justify your answer.

[3] 5. Yasmin is constructing a rectangular prism using exactly 96 cm^2 of cardboard. The prism will have the greatest possible volume.

a) What will be its dimensions?

b) What will be its volume?

[3] 6. Mathew is constructing a rectangular prism with volume exactly 720 cubic inches. It will have the least possible surface area.

a) What will be its dimensions?

b) What will be its surface area?

[5] 7. A cylindrical can is to have a volume of 540 cm^3 . What should its dimensions be to minimize the amount of material used to make it?

[6] 8. Mr. Rexhepi is designing glass storage jars with surface area 765 cm^2 . The jars are cylinders. He wants to **maximize the volume** of each jar to save on the materials cost.

a) What **dimensions** should he use?

b) What will the **volume** be?