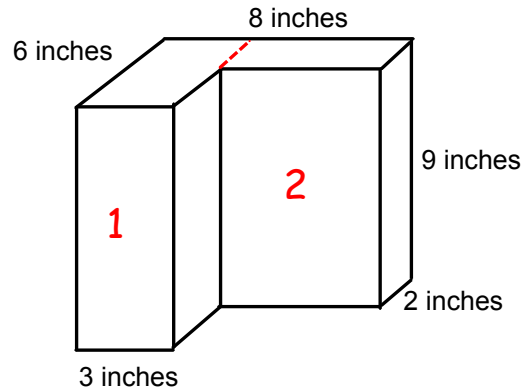


Area and Volume Applications

Get Calculators and IMJ's

- 1 A company packages one of its products in a box shaped like the figure shown below.



Part A

What is the volume, in cubic inches, of the box?

Show All Work

#1

$$V = lwh$$

$$V = 3 \times 6 \times 9$$

$$V = 162 \text{ in.}^3$$

#2

$$V = lwh$$

$$V = 5 \times 2 \times 9$$

$$V = 90 \text{ in.}^3$$

$$162 + 90 = 252 \text{ in.}^3$$

Answer 252 cubic inches

Part B

The company fills 75% of the box with packing material to protect the product from breaking. The company pays \$0.02 per cubic inch for the packing material.

What is the cost, in dollars, to fill 75% of 1 box with packing material? Do **NOT** include tax.

Show All Work

75% of 252

$$0.75 \times 252 = 189 \text{ in.}^3$$

$$189 \times \$0.02 = \$3.78$$

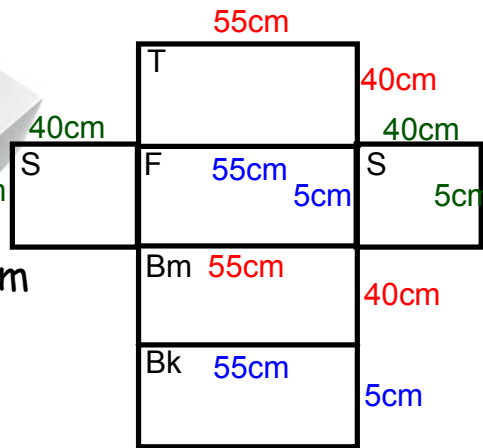
Answer \$ \$3.78

2 A birthday gift box is 55 cm long, 40 cm wide and 5 cm high. The sheet of paper you want to use to wrap the box measures 75 cm by 100 cm.

Part A

Is the paper large enough to wrap the gift?

Show All Work



- T - 2200
- Bm - 2200
- F - 275
- Bk - 275
- S - 200
- S - 200
- Total SA - 5350 cm²

On the lines below, explain your decision. Use words, numbers, and/or symbols to justify your answer.

Find the area of the sheet of paper by multiplying 75 by 100 to get 7500 square centimeters. Since the surface area of the box (5350 square centimeters) is less than the area of the sheet of the paper, it should be enough to wrap the box.

Part B

What is the volume of the gift box?

$$V = lwh$$

$$V = 55 \times 40 \times 5$$

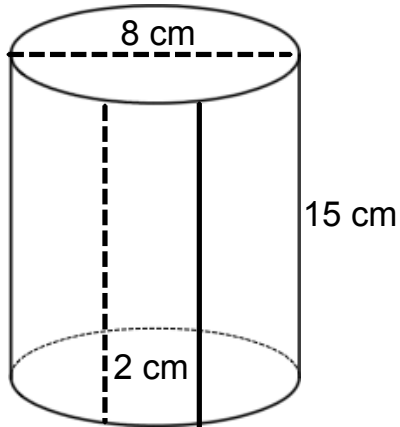
$$V = 11,000 \text{ cm}^3$$

Answer 11,000 cm³

3

Part A

How much dog food will fit into the can pictured below?



$$V = \pi r^2 h$$

$$V = \pi 4^2 \times 15$$

$$V = 240\pi \text{ cm}^3$$

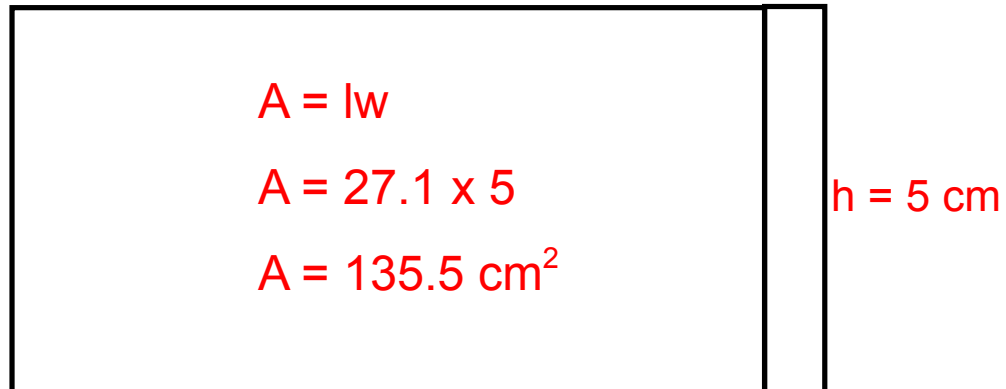
$$V \approx 754.0 \text{ cm}^3$$

Part B

Answer 754.0 cm³

The label on the dog food can has a 2 cm overlap.
Find the surface area of the label.

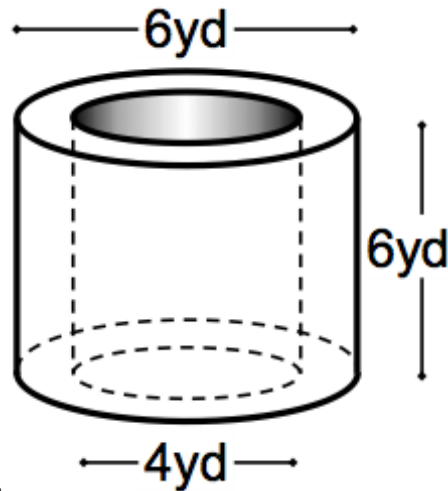
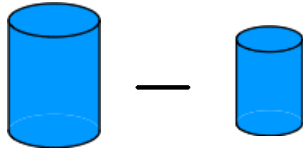
$$C = 2\pi r = 2\pi 4 = 25.1 \text{ cm} + 2 \text{ cm} = 27.1 \text{ cm}$$



Answer 135.5 cm²

4**Part A**

How many cubic yards of concrete will be needed to make the section of sewer pipe below.

**Show All Work**

$$V = \pi r^2 h$$

$$V = \pi 3^2 \times 6$$

$$V = 54\pi \text{ yd}^2$$

$$V = \pi r^2 h \quad 54\pi - 24\pi = 30\pi$$

$$V = \pi 2^2 \times 6 \quad = 94.2 \text{ yd}^2$$

$$V = 24\pi \text{ yd}^2$$

Answer 94.2 cubic yards

Part B

The city is going to need 10 of these pipes to do the sewer upgrade. If concrete cost \$92 a cubic yard, how much will it cost to pour the pipe. Do NOT include tax or labor.

Show All Work

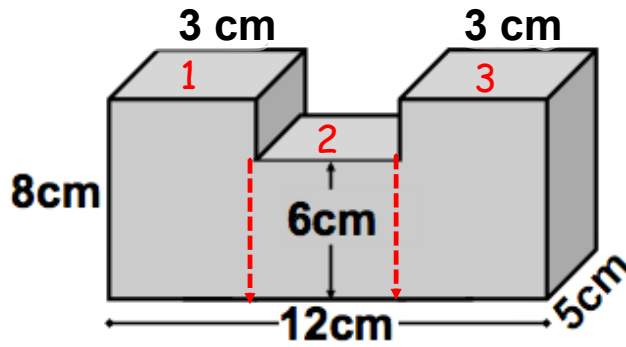
$$94.2 \times 10 = 942 \text{ yd}^2$$

$$942 \times \$92 = \$86,664$$

Answer \$ 86,664

5

A new design for a printer ink cartridge is shown below.



Part A

How many cubic centimeters of ink can it hold?

Show All Work

#1 & 3

$$V = lwh$$

$$V = 3 \times 5 \times 8$$

$$V = 120 \text{ cm}^3$$

$$120 \times 2 = 240 \text{ cm}^3$$

#2

$$V = lwh$$

$$V = 3 \times 5 \times 6$$

$$V = 90 \text{ cm}^3$$

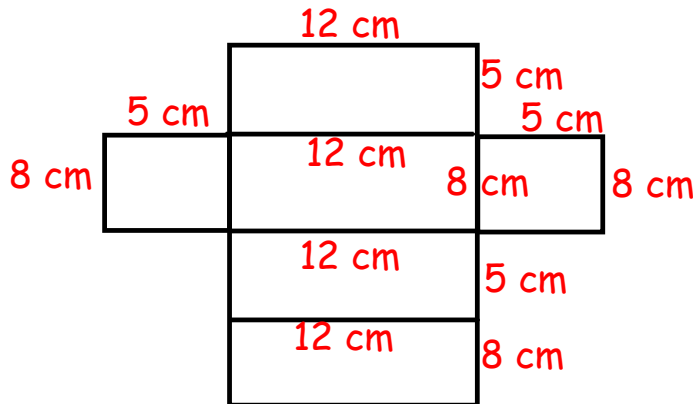
$$240 + 90 = 330 \text{ cm}^3$$

Answer 330 cubic centimeters

Part B

Show All Work

Ink cartridges come in foil wrap to prevent the ink from drying out. What is the least amount of foil that would be needed to cover the cartridge?



$$T - 12 \times 5 = 60$$

$$Bm - 60$$

$$F - 12 \times 8 = 96$$

$$Bk - 96$$

$$S - 5 \times 8 = 40$$

$$S - 40$$

$$\text{Total SA} - 392 \text{ cm}^2$$

Answer 392 square centimeters