

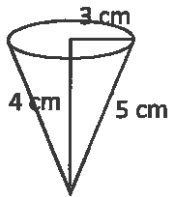
Applied Math 40S
DESIGN AND MEASUREMENT
Test

Name: _____

Question 1

Total: 1 mark

What is the minimum amount of paper required to create the cone-shaped paper cup shown below? (Diagram is not drawn to scale.) $r = 3 \text{ cm}$, $h = 4 \text{ cm}$, $s = 5 \text{ cm}$



Select the correct answer.

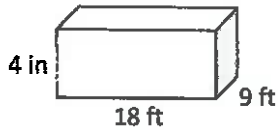
- A) 37.70 cm^2
- B) 47.12 cm^2
- C) 75.40 cm^2
- D) 113.10 cm^2

Question 2

Total: 2 marks

A student was given the following diagram and was asked: "How many cubic yards of soil are required to fill this garden with 4 inches of soil?" (Diagram is not drawn to scale.)

$h = 4 \text{ in}$, $l = 18 \text{ ft}$, $w = 9 \text{ ft}$



The student provided this answer: $18 \times 9 \times \frac{1}{3} = 54 \text{ ft}^3 = 18 \text{ yd}^3$

Explain the student's error and provide the correct answer.

Question 3

Total: 3 marks

A bathroom floor is covered by 15 floor tiles. Each tile measures 18 in. \times 18 in.

a) How many floor tiles measuring 6 in. \times 6 in. would be needed to cover the same area?

Show your work.

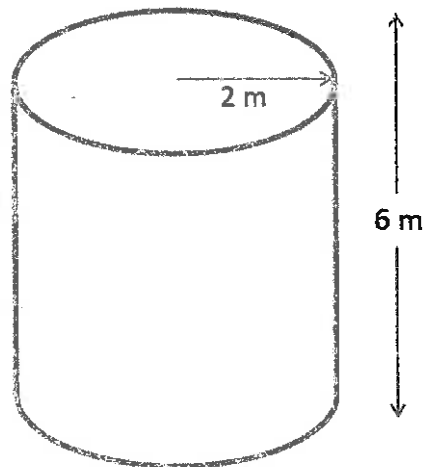
(2 marks)

b) You would like to redo the floor with 6 in. \times 6 in. tiles. These tiles are sold in packages of 5 tiles and cost \$4.00 per package (taxes included). How much would it cost to buy the number of tiles you calculated in (a)?

(1 mark)

Question 4

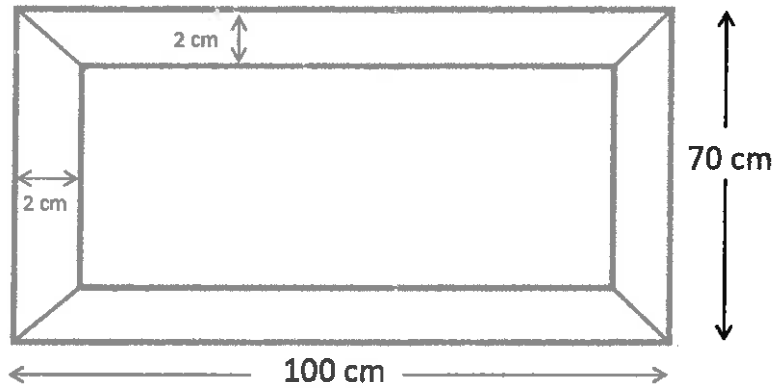
A cylindrical storage tank that measures 6 m tall and has a radius of 2 m is going to be covered with sheet metal. If the sheet metal costs \$2.08 per m^2 , find the cost to cover the entire cylinder, including the top and bottom and both taxes.



The formula for surface area of a cylinder is: $SA = 2\pi r^2 + 2\pi rh$
Show your work.

3 marks

Question 5



The glass for a large picture frame must be 2 cm shorter than the dimensions of the frame, as shown below. Glass is purchased for \$41.82 per m^2 . Find the exact cost of the glass if partial costs are allowed. This cost should include GST and PST. Show your work in the space below:

3 marks

Question 6 (1 mark)

Select the best answer.

The Mathletica company manufactures inflatable exercise balls. If the cost of plastic for the balls is \$0.002/cm², which equation could be used to estimate the plastic cost, C , of one exercise ball with radius, r ?

A) $C = 0.002 \times 4\pi r^2$

B) $C = 0.002 \times \frac{4}{3}\pi r^3$

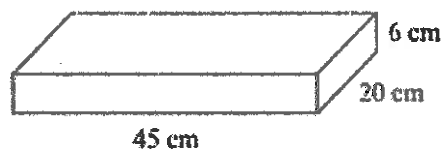
C) $C = \frac{4\pi r^2}{0.002}$

D) $C = \frac{4\pi r^3}{3(0.002)}$

Question 7 (1 mark)

Select the best answer.

Melia baked the following cake and will ice the top and the sides.



The surface area that needs to be iced is:

A) 1290 cm²

B) 1680 cm²

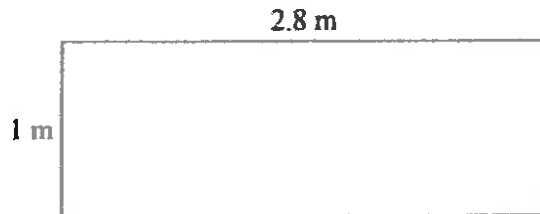
C) 2580 cm²

D) 5400 cm²

Question 8 (1 mark)

Select the best answer.

Maala needs to shovel a $1\text{ m} \times 2.8\text{ m}$ walkway after a 30 cm snowfall. The maximum amount of snow each full shovel can remove is 0.04 m^3 per scoop.



Assuming each scoop contains the maximum amount of snow, how many scoops will it take for her to remove all the snow from the walkway?

- A) 21
- B) 70
- C) 336
- D) 2100

Question 9

Hugo creates a scale model of a planet for art class. He wants to paint it.

- The radius of the model is 20 cm.
- He has one bottle of paint that will cover 12 000 cm².
- It is assumed that each coat applied requires the same amount of paint.

How many full coats of paint can be applied using the one bottle? Show your work.

2 marks

Question 10

a) What is the volume of a rubber hockey puck? (Diagram is not drawn to scale.)

(1 mark)



b) How many pucks can be produced for \$1000.00 if it costs \$0.24 to print a logo on each puck and rubber costs \$0.003 6 per cm^3 ?

(2 marks)

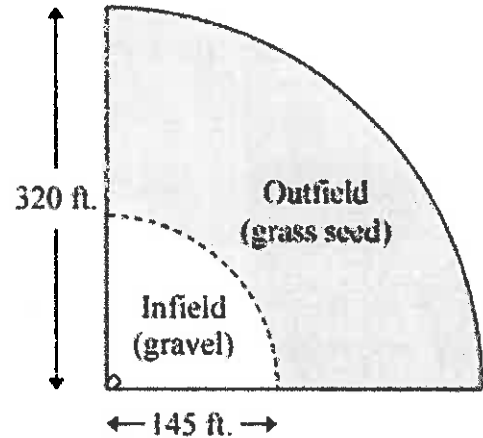
Question 11

Thierry wants to build a baseball field by his home. He is going to place gravel, to a depth of 4 inches, in the infield and grass seed on top of the existing soil in the outfield. (Diagram is not drawn to scale.)

The costs are as follows:

- \$1.50 per cubic foot of gravel
- \$16.00 per bag of grass seed, covering 6500 square feet

All items must be purchased in whole units and all prices are taxes included.



- a) Determine the total cost to build the baseball field. Assume the field is in the shape of a quarter-circle.

(4 marks)