

Pre-Test (V5)
Chapter 5: Volume and Area of Solids

1- Contents

Question	Item	Objective	Type	Skill
1	0141	GEO.04.05	Multiple-choice answer	Concepts
2	0384	GEO.04.04	Multiple-choice answer	Concepts
3	0279	GEO.04.02	Multiple-choice answer	Applications
4	0412	GEO.04.04	Multiple-choice answer	Applications
5	0313	GEO.04.02	Multiple-choice answer	Applications
6	0157	GEO.04.05	Multiple-choice answer	Concepts
7	0381	GEO.04.04	Multiple-choice answer	Concepts
8	0428	GEO.04.02	Multiple-choice answer	Concepts
9	0485	GEO.03.01	Multiple-choice answer	Concepts
10	0378	GEO.04.08	Multiple-choice answer	Applications
11	0392	GEO.04.04	Short-constructed answer	Applications
12	0168	GEO.04	Short-constructed answer	Applications
13	0395	GEO.04.04	Short-constructed answer	Applications
14	0148	GEO.04.04	Extended answer	Applications
15	0180	GEO.04.02	Extended answer	Applications

2- Correction key

1	C	/4
2	A	/4
3	B	/4
4	B	/4
5	B	/4
6	D	/4
7	A	/4
8	D	/4
9	C	/4
10	B	/4
11	The volume of the silo is 192 m^3 .	/4
12	The maximum number of people is 216.	/4
13	138.16 cm^3	/4

14 Work:

/4

Radius of the foam tube

$$r = d \div 2 = 8 \div 2 = 4 \text{ cm}$$

Volume of a foam tube + volume of a glass tube

$$V_{\text{cylinder}} = A_b \times h = \pi r^2 h \approx 3.14 \times 4^2 \times 3.5 \approx 175.929 \text{ cm}^3$$

Radius of a glass tube

$$r = d \div 2 = 2 \div 2 = 1 \text{ cm}$$

Volume of a glass tube

$$V_{\text{cylinder}} = A_b \times h = \pi r^2 h \approx 3.14 \times 1^2 \times 3.5 \approx 10.996 \text{ cm}^3$$

Volume of a foam tube

$$175.929 - 10.996 \approx 164.934$$

Volume of the 200 foam tubes

$$200 \times 164.934 \approx 32\,987$$

ANSWER: The volume of foam needed was $\approx 32\,987 \text{ m}^3$.

15 Work:

/4

Calculation of area of the side:

Lateral area of a cylinder

$$\begin{aligned} A_{\text{lat}} &= C_b \times h = 2\pi rh \\ &\approx 2 \times 3.14 \times 4 \times 2 \\ &\approx 50.265 \text{ m}^2 \end{aligned}$$

Total area that the paint can cover:

$$5 \text{ litres} \times \frac{12 \text{ m}^2}{\text{litre}} = 60 \text{ m}^2$$

Result: Yes

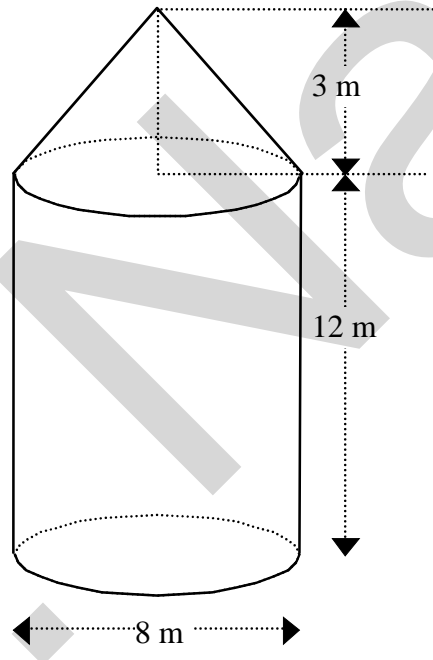
Name: _____

Group: _____

Each question is worth 4 marks.

For questions 1 to 10, circle the correct answer.

- 1 The volume of a container of olive oil is 720 cm^3 . Which of the following measures is equivalent to this volume? /4
- A) 7.2 kL
B) 72 L
C) 720 mL
D) 7200 dL
- 2 A grain silo on a cement base is the shape of a cylinder with a cone on top. The dimensions of the silo are given in the diagram. /4



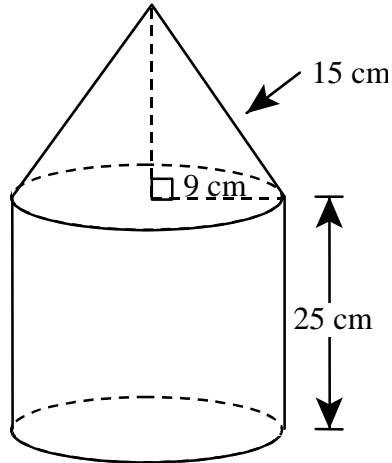
The owner wants to paint the exterior of the silo.

Which of the following expressions will give the area to be painted?

- A) $[(\pi \times 4 \times 5) + (2 \times \pi \times 4 \times 12)] \text{ m}^2$ C) $[(\pi \times 4 \times 3) + (2 \times \pi \times 4 \times 12)] \text{ m}^2$
B) $[(\pi \times 8 \times 8.54) + (2 \times \pi \times 8 \times 12)] \text{ m}^2$ D) $[(\pi \times 8 \times 3) + (2 \times \pi \times 8 \times 12)] \text{ m}^2$

3 What is the total surface area of the following solid?

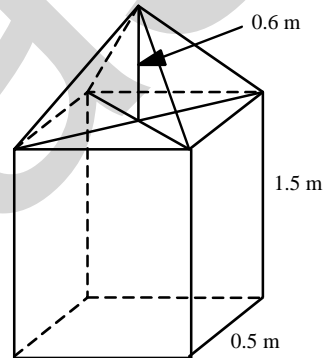
/4



- A) Approximately 1838 cm^2
B) Approximately 2092 cm^2
C) Approximately 2601 cm^2
D) Approximately 7380 cm^2

4 Helen made a compost bin in the shape of a right prism that has a square base topped with a pyramid that is 0.6 m high.

/4



What is the total volume of this bin in cubic metres?

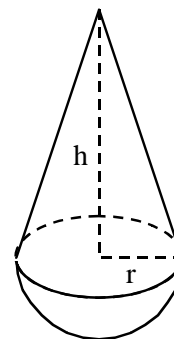
- A) 0.175
B) 0.425
C) 0.450
D) 0.525

5 A buoy has been taken out of a river to be repainted. This buoy is made up of a hemisphere topped by a cone.

/4

Which of the following measures is the best approximation of the total area of this buoy?

$h = 120 \text{ cm}$
 $r = 40 \text{ cm}$



- A) $25\,133 \text{ cm}^2$
B) $25\,948 \text{ cm}^2$
C) $35\,186 \text{ cm}^2$
D) $36\,002 \text{ cm}^2$

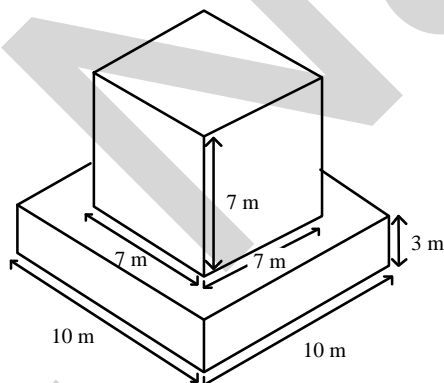
- 6 Four test tubes in a chemistry lab hold various substances.
The volume of liquid contained in each test tube is presented in the table :

/4

Test tube	Volume of liquid
n° 1	0.015 dm^3
n° 2	12 cm^3
n° 3	0.00015 m^3
n° 4	1100 mm^3

Which of the four test tubes contains the least amount of liquid?

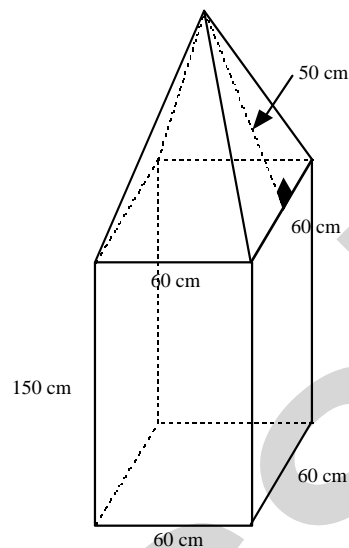
- A) Test tube n° 1
B) Test tube n° 2
C) Test tube n° 3
D) Test tube n° 4
- 7 Which chain of operations can be used to find the volume of a decomposable solid with the following dimensions? /4



- A) $V = (7 \times 7 \times 7) + (10 \times 10 \times 3)$
B) $V = (7 \times 7 \times 4) + (4 \times 10 \times 3)$
C) $V = (7 \times 7 \times 4) + (10 \times 10 \times 3)$
D) $V = (7 \times 7 \times 7) + (4 \times 10 \times 3)$

- 8 A monument has the shape of the decomposable solid shown to the right: a square pyramid on top of a right prism with a square base. Which of the following expressions can be used to calculate the area of the exterior surface of the monument, in square centimetres?

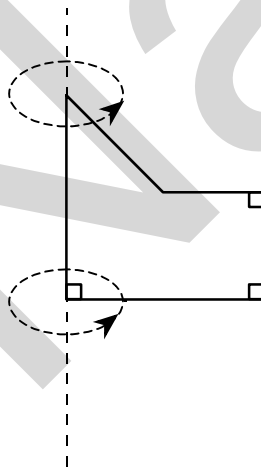
/4



- A) $60^2 \times 150 + 4 \times 60 \times 50$
 B) $60^2 \times 150 + \frac{4 \times 60 \times 50}{2}$
 C) $4 \times 60 \times 150 + 4 \times 60 \times 50$
 D) $4 \times 60 \times 150 + \frac{4 \times 60 \times 50}{2}$

- 9 The figure shown rotates 360° about the given axis.

/4



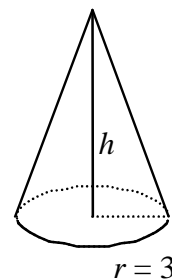
What solid is obtained by rotating this figure?

- A) A rectangular prism topped by a cone
 B) A rectangular prism topped by a pyramid
 C) A cylinder topped by a cone
 D) A cylinder topped by a pyramid

- 10 The radius of the base of a cone is 3 cm and its volume is 56.52 cm^3 . ($\pi = 3.14$) What is the height of the cone?

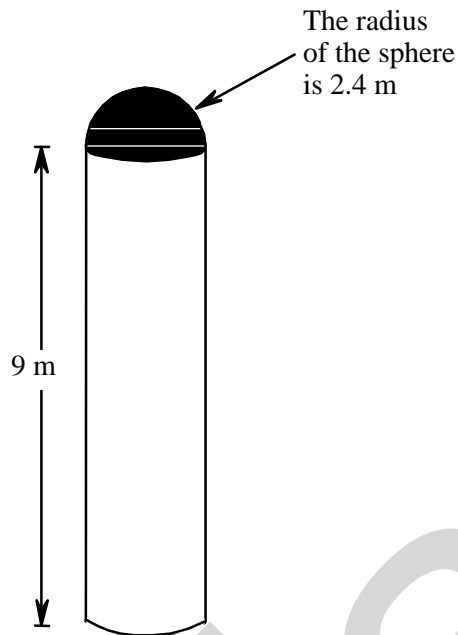
/4

- A) 2 cm
 B) 6 cm
 C) 9 cm
 D) 18 cm



For questions 11 to 13, write your answer in the space provided.

- 11 A farmer wants to build a silo in the shape of a cylinder with a hemisphere on top as shown in the diagram. /4
Both the cylinder and the hemisphere have the same radius.



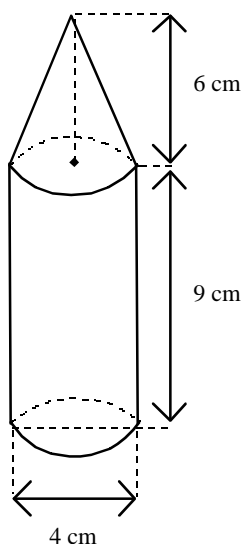
What is the volume of the silo to the nearest cubic metre?

The volume of the silo is _____.

- 12 In any assembly of people, each person should have 8 m^3 of air to be comfortable in the room. /4
If this norm is to be respected, what is the maximum number of people that should be allowed into a hall that is 24 m long, 18 m wide and 4 m high?

The maximum number of people is _____.

- 13 A group of students decides to build a model of a castle. Each tower has the shape and dimensions below: /4



Calculate the amount of modelling clay needed to build a tower. ($\pi = 3.14$)

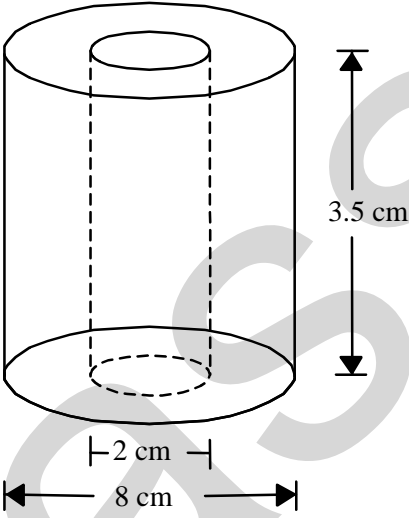
The amount of clay needed is _____ cm^3 .

For questions 14 and 15, you MUST SHOW ALL YOUR WORK.

- 14 A company produced 200 foam tubes to be used as packaging for glass tubing. Each of these foam tubes has a hole down the middle so that the glass tubing will fit inside snugly as shown in the following diagram: /4

What volume of foam, in cm^3 , was needed to manufacture the 200 foam tubes?

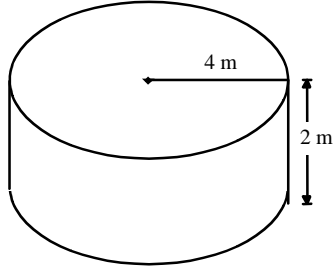
Work



Result: The volume of foam needed was _____ cm^3

- 15 Paul must paint the exterior surface of the side of his circular swimming pool. The height of the pool is 2 metres and its radius is 4 metres. Paul has 5 litres of paint. Each litre covers 12 m^2 . Does Paul have enough paint to complete the job? /4

Work



Answer: Does Paul have enough paint?
_____ Yes _____ No