

**SIR ARTHUR LEWIS COMMUNITY COLLEGE
SCIENCE, TECHNOLOGY, INNOVATION AND SUSTAINABILITY**

**2024 – 2025 ACADEMIC YEAR - SEMESTER I
END OF SEMESTER EXAMINATION**

COURSE TITLE : CRAFT MATHEMATICS III

COURST CODE : MAT119

LECTURER : TITUS MATHURIN

DATE : Thursday 19th December 2024

TIME : 9.00 – 11.00 AM

DURATION : 2 HRS

STUDENT ID# :

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. Write your student's ID number on all the work you hand in.
2. This paper consists of **eight (8)** questions, ***all questions are compulsory.***
3. Total marks for this paper is 75.
4. Write in BLACK or BLUE pen. ***(NO WRITING IN PENCIL)***
5. Show all calculations and working.
6. **Only NON-PROGRAMMABLE** calculators are permitted.
7. ***A formula sheet is included.***
8. Do not use correction fluid.

DO NOT TURN THE PAGE UNTIL YOU ARE TOLD TO DO SO

FORMULAR:

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

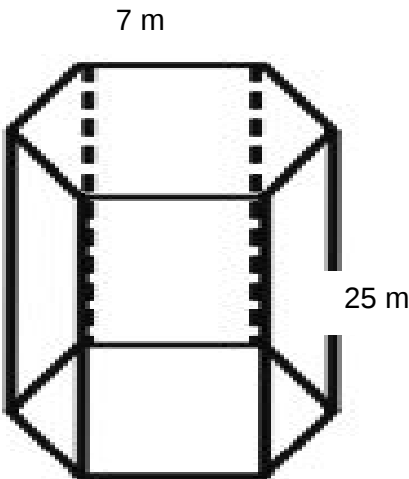
$$\text{Total surface area of pyramid} = \frac{1}{2}lp + B$$

$$\text{Volume of pyramid} = \frac{1}{3}Bh$$

$$\text{Volume of a cone frustum} = \frac{\pi}{3}h(R^2 + r^2 + R * r)$$

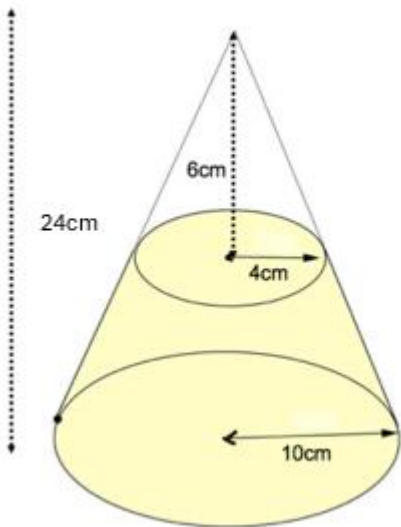
QUESTIONS

1.



The above diagram shows a hollow hexagonal prism. Decompose the solid into its individual shapes (net drawing) and determine the area of each shape. **[4 marks]**

2.



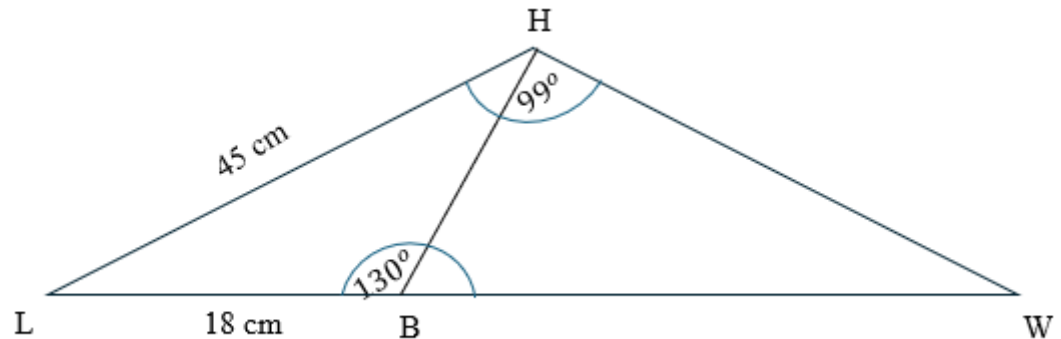
Use $\pi = 22/7$

The above diagram represents a cone frustum. Calculate the volume of the frustum. **[5 marks]**

3. Triangle XYZ has sides $x = 21$, $y = 13$ and angle Z measures 55° .

- Draw triangle XYZ. [2 marks]
- Calculate the value of side z. [6 marks]

4.



Given the above diagram, calculate the following:

- The size of the angles LWH and HLW. [3 marks]
 - The size of the angles HLW. [6 marks]
 - The dimension of the side HW. [4 marks]
 - The dimension of the side BW. [6 marks]
5. The right pyramid has a square base of 10 cm and a volume of 700 cm^3 .
- Sketch and label the right pyramid. [2 marks]
 - Calculate the height of the pyramid. [4 marks]
 - Calculate the total surface area of the pyramid. Hint: use Pythagoras' theorem to determine l . [5 marks]

6. Simplify the following expressions:

a. $\frac{2w^2q^3}{16q^4r}$ [4 marks]

b. $\frac{4^{m+2} * 32^{7-m}}{64^m}$ [5 marks]

7. a. Expand the logarithmic expression below:

$$\log_5\left(\frac{w}{q^4r}\right)$$
 [4 marks]

b. Simplify the logarithmic expression below:

$$2\log h - 3\log(w - 2) + \log(r + 3)$$
 [4 marks]

8. Solve the following equations:

a. $\frac{3}{147}^{3t} = 729^{4-t}$

[5 marks]

b. $3^{4x-3} = 7^x$

[6 marks]

END OF EXAMINATION