

Dear G11 students,

Good morning,

I hope this message finds you well.

I will not be able to join you in school today as I am feeling unwell. My apologies for any inconvenience this may cause.

For our math classes today, please follow the instructions outlined below:

Session 1:

- Exam.Net key code: **XwE6g1**
- The exam will be closed at 12:15 PM today.

Session 2:

- Upon completion of the exam, please proceed to slides 3 to 5.
- Document your workings in your notebook.
- Discussion of correct answers will be held during tomorrow's session.

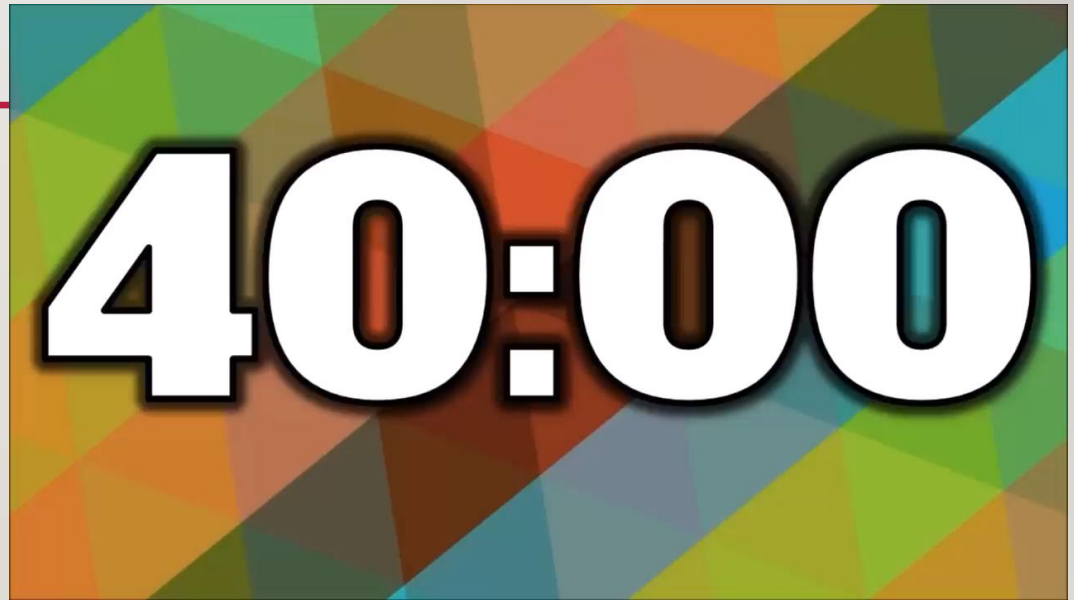
Thank you for your understanding and cooperation. I look forward to seeing you all tomorrow.

Best regards,

Ms. Eunice

VORONOI DIAGRAM EXAM.NET KEY CODE:

XwE6g1



3D solid

Formula for Volume (V) and Surface Area

Rectangular Prism



$$V = lwh = \text{length} \times \text{width} \times \text{height}$$

$$SA = 2lw + 2hw + 2lh$$
$$= 2(\text{length} \times \text{width}) + 2(\text{height} \times \text{width}) + 2(\text{length} \times \text{height})$$

Sphere



$$V = \frac{4}{3}\pi r^3 = \frac{4}{3} \times \pi \times \text{cube of radius}$$

$$SA = 4\pi r^2 = 4 \times \pi \times \text{square of radius}$$

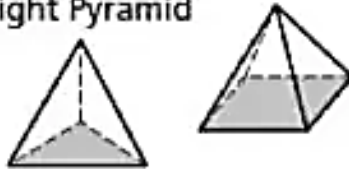
Right Circular Cylinder



$$V = Bh = \text{area of base} \times \text{height}$$

$$SA = 2B + Ch = (2 \times \text{area of base}) + (\text{circumference} \times \text{height})$$

Right Pyramid



$$V = \frac{1}{3}Bh = \frac{1}{3} \times \text{area of base} \times \text{height}$$

$$SA = B + \frac{1}{2}Pl$$
$$= \text{area of base} + (\frac{1}{2} \times \text{perimeter of base} \times \text{slant height})$$

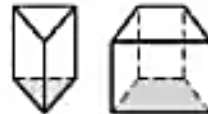
Right Circular Cone



$$V = \frac{1}{3}Bh = \frac{1}{3} \times \text{area of base} \times \text{height}$$

$$SA = B + \frac{1}{2}Cl = \text{area of base} + (\frac{1}{2} \times \text{circumference} \times \text{slant height})$$

General Prisms



$$V = Bh = \text{area of base} \times \text{height}$$

$$SA = \text{sum of the areas of the faces}$$

Exercise 1H

- 1** Find the volume of each object:
- a** A cone with a base radius of 22 cm and a height that is half of the base's circumference.
 - b** A regular hexagonal prism with base side lengths 5 cm and height 23 cm.
 - c** A hemisphere whose circular face has a surface area of 412 cm^2 .
- 2** The grain stored inside a cylindrical silo is transferred to a transport container in the shape of a triangular prism. The container's triangular base has side lengths 5.8 m, 5.8 m and 8.1 m and height 7.2 m. The silo has a radius of 5.83 m.
- a** Find the volume of grain that will be removed from the silo if the container is completely filled.
 - b** Find the amount by which the height of grain inside the silo will decrease. Give your answers to an appropriate degree of accuracy.
- 3 a** Estimate the volume in m^3 of each of the following (approximately) spherical objects.
- i** A lithium atom, radius 0.15 nm ($1 \text{ nm} = 1 \times 10^{-9} \text{ m}$)
 - ii** The Earth, which has equatorial circumference = 40 075 km

Conversion: $1 \text{ km}^3 = 1\,000\,000\,000 \text{ m}^3$

Area of hexagon:

$$\frac{3\sqrt{3}}{2}a^2$$

- iii UY Scuti, one of the largest known stars, with diameter equal to 1700 solar radii (radius of Sun = $6.957 \times 10^5 \text{ km}$)
 - b Hence, determine which is relatively larger: the Earth compared to an atom, or UY Scuti compared to the Earth.
- 4 a Find the volume of material used to construct the Red Pyramid in Cairo, given that it has a height of 105 m, a base length of 220 m, and is estimated to be 96% solid.
- b Given that the average block of stone used to construct the pyramid had dimensions $130 \times 130 \times 30 \text{ cm}$ and weighed approximately 2250 kg, find the total weight of the pyramid.
- 5 A family is replacing the hot water cylindrical tank of the house. They cannot change the height of the boiler but they can double its width. If the previous tank could hold 100 l, predict the volume of the new tank. State the volume of the tank if its width has tripled.