Unit #4 Test – Measurement & Geometry vA

Neat and **complete solutions** are required for full marks.
Calculators and formula sheet are permitted. GOOD LUCK!

| [3 marks] A communication mark will be assigned based on: |
|---|
| ·   Organization of solutions and every question attempted |
| ·   Correct use of mathematical symbols, units and conventions |
| ·   Correct use of **therefore** statements |

COMM	E1
3	**28**

Overall Expectation

| **E1. Geometric and Measurement Relationships** |
|---|
| ●   demonstrate an understanding of the development and use of geometric and measurement relationships, and apply these relationships to solve problems, including problems involving real-life situations |

PART A: [6 marks] **Multiple Choice:** Circle the correct answer.

1. The **sum** of all **interior angles** of an **octagon (8 sides)** is:
   A)   180°   B) 360°   **C) 1080°**   D) 1440°

2. The correct measure for **y** using the diagram on the right:
   A)   72°   **B) 125°**   C) 540°   D) 108°

3. Which of the following best describes 420 mL in **ounces**   (1 ounce = 29.574 mL) ?
   A)   *420 ounces*   B) *12 421.08 ounces*   C) *29.574 ounces*   **D) *14.2 ounces***

4. The volume of a pyramid is ___ times of the volume of a prism with the **same base** and the **same height**.
   A)   2   B) *3*   C) 4/3   **D) 1/3**

5. An **inscribed angle** is _____ the central angle :
   A)   *equal*   **B) *half***   C) *twice*   D) *complementary*

6. A baseball has a volume of $140 \ cm^3$. What is the approximate **radius**?
   A)   *33.4 cm*   B) *3.9 cm*   **C) 3.2 cm**   D) *5.8 cm*
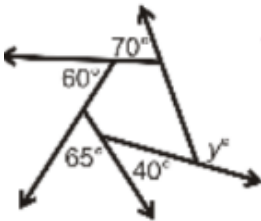
PART B: Round answers to **2 decimal places** where applicable.

7. [2 marks] A kite is flying in the wind as seen below. Find the **height** of the kite.
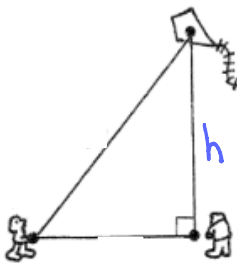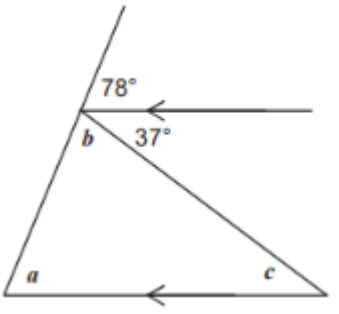
$$13^2 + h^2 = 35^2 \checkmark$$
$$169 + h^2 = 1225$$
$$h = \sqrt{1056}$$
$$h \doteq 32.5 \ units \checkmark$$

∴ _____

8. [2 marks] **Convert** 140 mL/sec to L/min.
   (1 L = 1000 mL , 60 sec = 1 min)

$$\frac{140 \ mL}{1 \ sec} \times \frac{1 \ L}{1000 \ mL} \times \frac{60 \ sec}{1 \ min} \checkmark$$
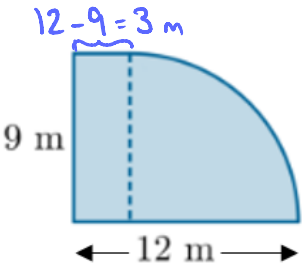
$$= 8.4 \ L/min \checkmark$$

9. [3 marks] Determine the measures of angles **a**, **b**, and **c**. Show your work. Include the **rule/pattern** for full marks.

$$b = 180 - 78 - 37 \ (SA) \checkmark$$
$$= 65°$$

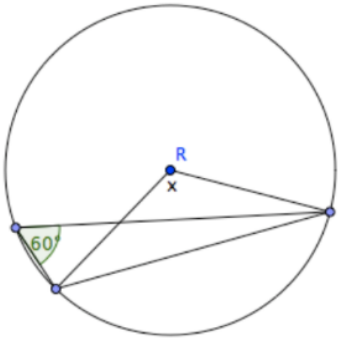$$c = 37° \ (PLT-Z) \checkmark$$

$$a = 180 - 65 - 37 \ (ASTT) \checkmark$$
$$= 78°$$

10. [3 marks] Find the **perimeter** of this shape. Leave as an **exact** answer.

$C_{\frac{1}{4}0} = \frac{1}{4}(2\pi r)$ ✓ $P = 12 + 9 + 3 + 4.5\pi$

$= \frac{1}{4}(2)(\pi)(9)$ $= 24 + 4.5\pi$ m ✓

$= 4.5\pi$ m ✓

∴ _____

12-9=3 m

9 m

← 12 m →

11. [2 marks] Determine the measure of $\angle x$. Include the **property** for full marks.

$x = 2(60)$ (CAIAP) ✓

$= 120°$ ✓

R
x
60°

12. Given the following Toblerone chocolate bar:

a) [2 marks] How much chocolate, **in** mL, does this bar have?
($1\ cm^3\ =\ 1\ mL$)

$V = \left(\frac{b\ell}{2}\right)(h)$ ✓

$= \left(\frac{(3.6)(3.1)}{2}\right)(21)$

$= 117.18\ cm^3$ ✓

$= 117.18\ mL$ ✓

∴ _____

3.1 cm
TOBLERONE
21 cm
3.6 cm

b) [3 marks] How much **material** will it take to make the chocolate bar box?

$SA = 2\left(\frac{bh}{2}\right) + 3(\ell w)$

$w^2 = 3.1^2 + 1.8^2$
$w^2 = 12.85$
$w \doteq 3.58\ cm$ ✓

$= 2\left(\frac{(3.6)(3.1)}{2}\right) + 2(21)(3.58) + (3.6)(21)$

$= 11.16 + 150.36 + 75.6$

$= 237.12\ cm^2$ ✓

∴ _____

13. [3 marks] Cyrus is painting the **white region** of his floor based on this image. If the white paint costs $15.30 per ft^2, how much will the project **cost**?

$A = A_{rectangle} - A_{square} - A_{triangle}$ ✓

$= (300)(150) - (100)^2 - \left(\frac{(150)(120)}{2}\right)$ ✓

$= 45000 - 10000 - 9000$

$= 26000\ ft^2$ ✓

$Cost = (26000)(15.3)$

$= \$397\ 800$ ✓

∴ _____

← 100 ft →   ← 120 ft →
150 ft
← 300 ft →
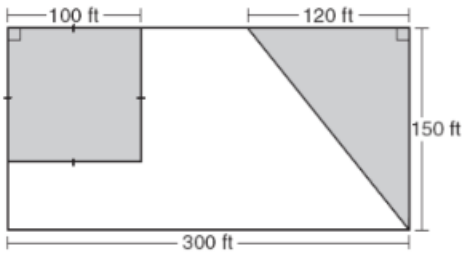
14. [2 marks] A **cylindrical** can has a **hemisphere (half a sphere) indented** into it. How much **paint** is needed to cover **the side and the top** of the can? (*do not paint the bottom that touches the ground*)

$A_{lateral} = 2\pi rh$

$= 2\pi(5)(9)$

$= 90\pi\ in^2$

$A_{hemisphere} = \left(\frac{1}{2}\right)4\pi r^2$

$= 2\pi(5)^2$

$= 50\pi\ in^2$

$SA = 90\pi + 50\pi$

$= 140\pi$

$\doteq 439.82\ in^2$ ✓

∴ _____

9 in.
5 in.