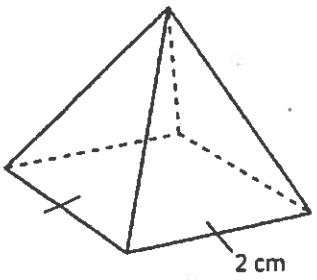
MPM1DI V1 Skill Reflection **3-D Measurement** /15 Name: Solutions.

NOTE: Full solutions are required for full marks.

1. Calculate the volume of this figure, given the height of the figure is 9 cm and the base length is 2 cm. (2 marks)



$V = \frac{A_{base} \times h}{3}$ ✓

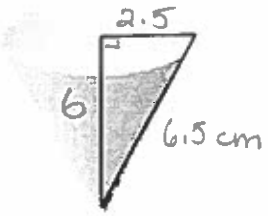
$= \frac{2^2(9)}{3}$

$V = 12\ cm^3$ ✓

2. A conical paper cup at a water dispenser has a diameter of 5 cm, and a height of 6 cm, (4 marks)

slant height is 6.5 cm

a) How much paper, to the nearest square centimetre, is used to make the cup?



$s^2 = 6^2 + 2.5^2$

$s^2 = 42.25$

$s \doteq 6.5$, ~~$s \doteq -6.5$~~

$SA = \pi r s$ ✓

$= \pi (2.5)(6.5)$ ✓

$\doteq 51\ cm^2$ ✓

∴ it will take about 51 cm^2 of paper to make the cup.

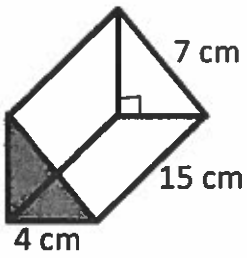
b) If an extra 8% of material is required for the seams and rim, how much paper is required to make the cup in part (a) ?

Total $= 51 \times 1.08$

$\doteq 55\ cm^2$ ✓

∴ it will require about 55 cm^2

3. Calculate the surface area of this **right**-triangular prism to the nearest tenth. (4 marks)



$x^2 = 7^2 - 4^2$

$x^2 = 33$ ✓

$x = \sqrt{33}$, $x > 0$

$S.A. = A_{3\ rectangles} + A_{\Delta} \times 2$ ✓

$= 15(4) + 15(7) + 15(\sqrt{33}) + \frac{2bh}{2}$ ✓

$= 60 + 105 + 86.168 + 4(\sqrt{33})$

$= 251.168 + 22.978$

$= 274.146$

$SA \doteq 274.1\ cm^2$ ✓

4. John built his own skateboard half-pipe which he is now going to paint. The depth of the half-pipe is 3 m and the length is ~~25~~ 17 m. Each pail of paint covers 120 m^2. How many pails of paint will be needed? (~~4~~ 5 marks)

$SA = \frac{2\pi rh}{2}$

$= \pi rh$ ✓

$r = 3\ m$, $h = 17\ m$

$SA = \pi (3)(17)$ ✓

$SA \doteq 160.2\ m^2$ ✓ ✓

1 mark for form

Number of Pails $= \frac{SA}{120}$

$= \frac{160.2}{120}$

$\doteq 1.3$

∴ you would need to purchase 2 pails of paint. ✓