Name: _____ Date: _____

Baldivis Secondary College

Year 11 Applications

Test 3, 2016

Topics – Perimeter, Area, Surface Area and Volume

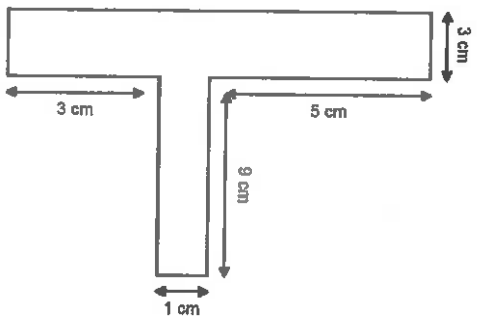
	32
	=___ %

Total Time:	***50** minutes*
Total Reading:	*5 minutes*
Total Working:	*45 minutes*
Weighting:	*4% of the year, 8% of the semester.*
Equipment:	*SCSA Formula Sheet; 1 page notes (**A4 one side, Unfolded**), CASIO ClassPad; Scientific Calculator*

1. **[4 marks: 1, 1, 2]**

Calculate the perimeter of the following shapes:

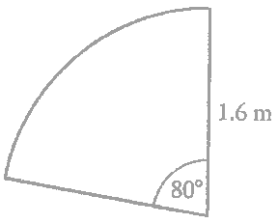
a)



$P = 3+5+9+1+9+3+3+9$ (½)

$= 42\text{cm}$ ✓

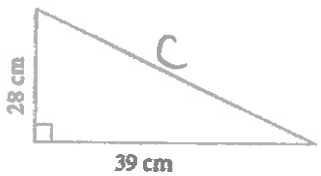
b)



$P = \left(\frac{80}{360} \times 2 \times \pi \times 1.6\right) + (2 \times 1.6)$ (½)

$= 5.43\text{cm}$ ✓

c)



$c = \sqrt{39^2+28^2}$ (½)

$= 48.01\text{cm}$ ✓

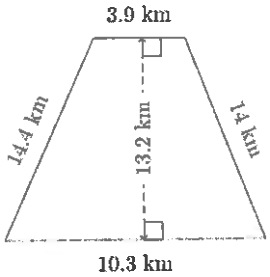
$P = 28+39+48.01$ (½)

$= 115.01\text{cm}$ ✓

2. **[5 marks: 1, 2, 2]**

Calculate the area of the following shapes:

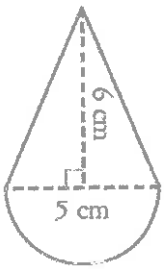
a)



$A = \frac{3.9+10.3}{2} \times 13.2$ (½)

$= 93.72 km^2$ ✓

b)



$A_\Delta = \frac{1}{2} \times 6 \times 5$

$= 15 cm^2$ ½

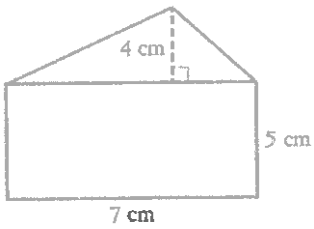
$A_\square = \frac{1}{2} \times \pi \times 2.5^2$

$= 9.82 cm^2$ ½

$T.A. = 15 + 9.82$

$= 24.82 cm^2$ ✓

c)



$A_\Delta = \frac{1}{2} \times 7 \times 4$

$= 14 cm^2$ ½

$A_\square = 5 \times 7$

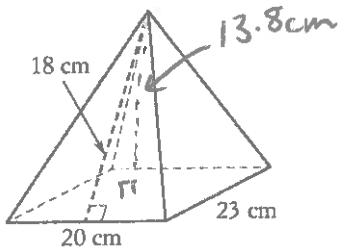
$= 35 cm^2$ ½

$T.A = 14 + 35$

$= 49 cm^2$ ✓

3. **[1 mark]**

The volume of the solid shown could be found using which calculations?



A $\frac{1}{3} \times 20 \times 23 \times 18$

B $\frac{1}{3} \times 20^2 \times 18$

C $\frac{1}{3} \times 23^2 \times 13.8$

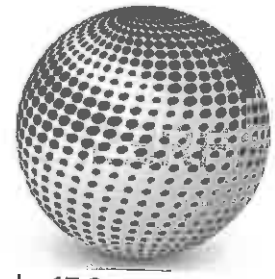
D $\frac{1}{3} \times 20 \times 23 \times 13.8$ ✓

E $20 \times 23 \times 13.8$

3. **[4 marks: 2, 2]**

Find the surface area and volume of the following 3D solids:

a)



d = 17.3 cm

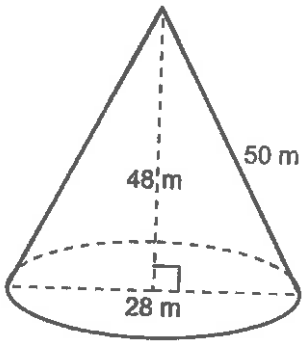
$S.A = 4 \times \pi \times 8.65^2$ (½)

$= 940.23 cm^2$ ✓

$V = \frac{4}{3} \times \pi \times 8.65^3$ (½)

$= 2711.05 cm^3$ ✓

b)



$S.A = \pi \times 14 \times 50 + \pi \times 14^2$ (½)

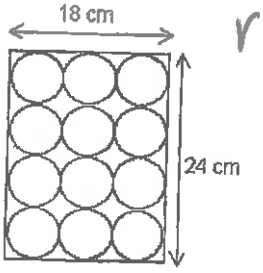
$= 2814.87 m^2$ ✓

$V = \frac{1}{3} \times \pi \times 14^2 \times 48$ (½)

$= 9852.03 m^3$ ✓

4. **[3 marks]**

Cans of soup are often packed in boxes as shown below. Calculate the area that is wasted in between all of the cans.



$r = 3 cm$ (½)

$A_{cans} = \pi \times 3^2 \times 12$ (½)

$= 339.29 cm^2$ ✓

$A_{\square} = 18 \times 24$ (½)

$= 432 cm^2$ ✓

$A_{wasted} = 432 - 339.29$ (½)

$= 92.71 cm^2$ ✓

5. **[3 marks: 2, 1]**

A rectangular photo frame has dimensions 12.7cm x 17.8 cm.

The border of the frame is 1.5 cm wide.

If a photo only just fits into the frame:

a) What area of the photo can be seen?

$12.7 - 3 = 9.7\text{cm}$ ½

$17.8 - 3 = 14.8\text{cm}$ ½

$A = 9.7 \times 14.8$ (½)

$= 143.56\text{cm}^2$ ✓

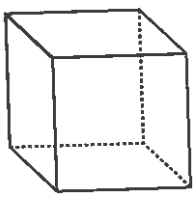
b) What area of the photo will be covered by the frame's border?

$A = 12.7 \times 17.8 - 143.56$ (½)

$= 82.5\text{cm}^2$ ✓

6) **[2 marks]**

If the volume of a cube is 27cm^3, what is the surface area of the cube? (Show all working)



$L = \sqrt[3]{27}$ (½)

$= 3\text{cm}$ ✓

$SA = 6 \times 3^2$ (½)

$= 54\text{cm}^2$ ✓

(-1 no working)

7. **[3 marks]**

Three identical tennis balls with an 8cm diameter are stacked in a cylindrical container. Calculate the surface area and volume of the inside of this container.

$h = 8 \times 3$ $r = 4\text{cm}$ ½

$= 24\text{cm}$ ½

$SA = 2 \times \pi \times 4^2 + 2 \times \pi \times 4 \times 24$ (½)

$= 703.72\text{cm}^2$ ✓

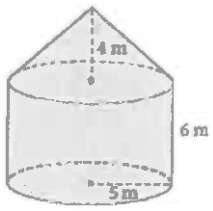
$V = \pi \times 4^2 \times 24$ (½)

$= 1206.37\text{cm}^3$ ✓

(-1 no working)

8. [3 marks]

The James family have the rain water tank shown below. What is the volume of the James' tank in cubic metres, correct to one decimal place? How many Litres of water can it hold?



$V = \frac{1}{3} \times \pi \times 5^2 \times 4 + \pi \times 5^2 \times 6$ ✓ (½) (½)

$= 576.0\ m^3$ ✓

Capacity = 576 000L ✓

The tank can hold 576 000L or 576 kL

9. [2 marks]

A corn cob, shaped like a cone, has a radius of 2.1cm and a slant height of 20.11cm. If each $1cm^2$ of the surface of the cob carries an average of four corn kernels, how many corn kernels would you expect to find on the entire cob of corn?

$SA = \pi \times 2.1 \times 20.11$ (½)

$= 132.67cm^2$

$\simeq 133cm^2$ ✓

Corn Kernels $= 4 \times 133$ (½)

$= 532$ ✓

or $146.5cm^2 \times 4$

$= 586$ kernels.

You would expect to find 532 corn kernels.

10. [2 marks]

The Transamerica Pyramid in San Francisco is shaped like a square pyramid. It has a slant height of 260.9 metres and each side of its base has a length of 44.2 metres. Find the lateral area of the building.

Remember: lateral area of a solid is the area of any face or surface that is not a base.

Lateral Area $= 4 \times \frac{1}{2} \times 260.9 \times 44.2$ ✓

$= 23063.56\ m^2$ ✓

~ END OF TEST ~