Name: _____ Date: _____

Class: _____

Baldivis Secondary College

Year 12 Essentials

Test 1, 2021

Topic – Measurement / Right Angle Triangles

/ 45

10%

Total Time: *50 min TOTAL*
Weighting: *5 %*
Equipment: *1 A4 page of notes (one side) and Calculator*

Question 1 — 4 marks

State what unit of capacity (millilitres, litres, megalitres or gigalitres) you would use when measuring the capacity of

i)

a) A cup of coffee ml

b) The swimming pool from your investigation megalitre

c) Dosage of liquid medicine for children ml

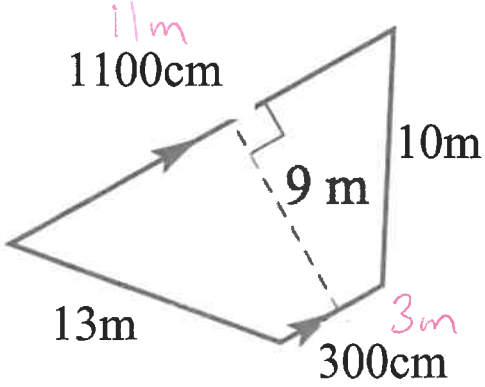
d) Serpentine Dam (one of our metropolitan dams) gigalitre

ii) a) Convert 31 metres to millimetres

b) Convert 40,000cm^2 to m^2

4m^2

Question 2 — 3 marks



(a) Name the 2-D shape.

Trapezium / Trapezoid,

(b) Calculate the perimeter of the shape in metres (m)

10 + 3 + 13 + 11 = 37m

(c) Calculate the area of the shape.

$\frac{1}{2}(a+b) \times h$

$\frac{1}{2}(3 + 11) \times 9$

Question 3 — 3 marks

A can of coke is 325 millilitres. What is the total volume of 7 lots of 24 can cartons? Give your answer in litres.

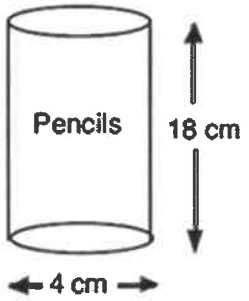
1 mark 325 x 24 x 7 = 54,600 mls

1 mark 54000 ÷ 1000

1 mark 54.6 L. Answer

Question 4 — 4 marks

A cylindrical pencil holder is shown. The height is 18 cm and the diameter 4 cm.



(a) What is the capacity of the pencil holder in cm^3 ?

$\pi r^2 \times h$

$= \pi \times 2^2 \times 18$ 1 mark

$= 226.19 cm^3$ 1 mark.

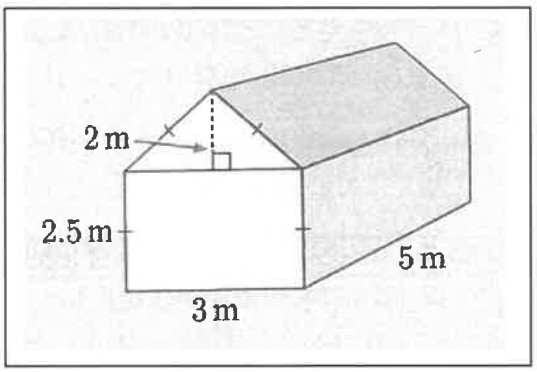
(b) The outer curved surface area is covered with coloured paper. What is the area of the paper?

Area Curve $= 2\pi r \times h$

$2 \times \pi \times 2 \times 18$ 1 mark

$226.19 cm^2$ 1 mark

Question 5 — 6 marks



Kirstie wishes to paint the tool shed (pictured) with two coats of zinc alum-paint. Each litre of zinc-alum covers $5m^2$ and costs \$8.50. It must be purchased in whole litres.

a) Find the area to be painted including the roof.

3 × 2.5 $(3 \times 2.5) \times 2 = 15 m^2$ (Front + Back)

5 × 2.5 $(5 \times 2.5) \times 2 = 25 m^2$ (side × 2) 1 mark (1 rectangle correct area)

Roof × 2 $(5 \times 2.5) \times 2 = 25 m^2$

Triangles × 2 $(\frac{1}{2} \times 3 \times 2) \times 2 = 6 m^2$ 1 mark (Triangle)

1 mark (add totals)

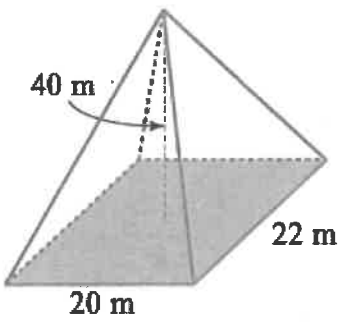
$15 m^2 + 25 m^2 + 25 m^2 + 6 m^2 = 71 m^2$ 1 mark correct answer.

b) Find the total cost of the zinc-alum paint.

$71 \div 5 = 14.2 L \approx 15 L$ needed. 1 mark working

$15 \times 8.50 = \$127.50$ 1 mark answer.

Question 6 — 2 marks



(a) Name the 3-D shape

Trap Pyramid.

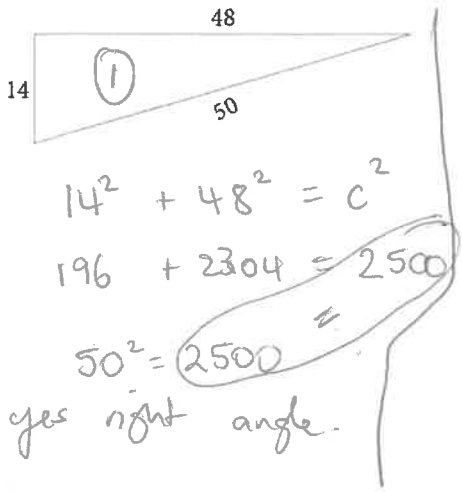
(b) Calculate the volume of the 3-D shape.

$\frac{1}{3} \times 20 \times 22 \times 40$ 1 mark

$= 5866.67 m^3$

Question 7 — 2,1 marks

1) Which of the following is a right angled triangle, and explain your reasoning.

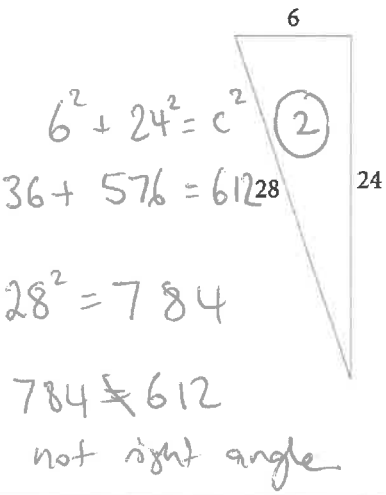


$14^2 + 48^2 = c^2$

$196 + 2304 = 2500$

$50^2 = 2500$

yes right angle.



$6^2 + 24^2 = c^2$

$36 + 576 = 612$

$28^2 = 784$

$784 \neq 612$

not right angle

1 mark Solve pythag Triangle 1.

1 mark Solve pythag Triangle 2

1 mark explanation

Question 8 — 3 marks

2) Use the triangle ΔDXP to answer the following questions

a) How long is the hypotenuse?

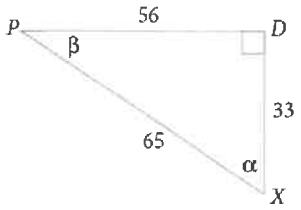
65 units

b) What is the length of the side opposite to α?

56 units

c) How long is the side adjacent to β

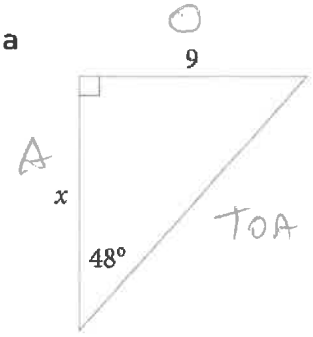
56 ~~B/S~~ units



Question 9 — 6 marks

1) Determine missing side of a triangle marked with pronumerals. Express your answers to 1 decimal place.

a

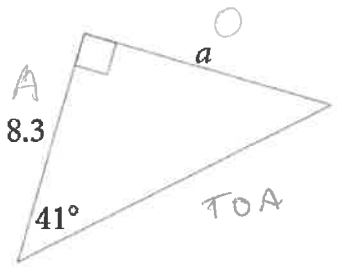


$\tan 48° = \frac{9}{x}$

$x = \frac{9}{\tan 48}$ 1 mark

$x = 8.1$ units 1 mark

b

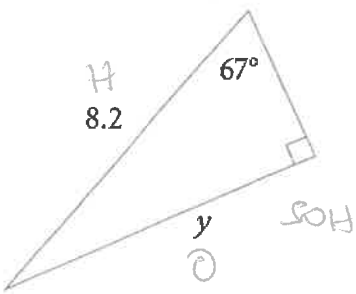


$\tan 41° = \frac{a}{8.3}$ 1 mark

$\tan 41 \times 8.3 = a$

$a = 7.2$ 1 mark

c



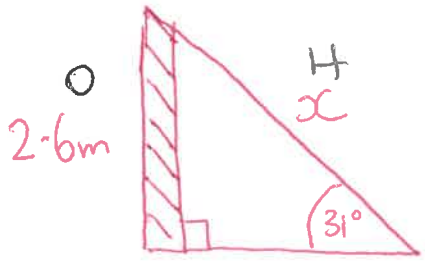
$\sin 67 = \frac{y}{8.2}$ 1 mark

$\sin 67 \times 8.2 = y$

$y = 7.5$ 1 mark

Question 10 **3 *marks***

The council is going to build a children's slide in the park. The top of the slide will be 2.6 m high and the slide will make an angle of 31° with the ground. Calculate the length of the slide, correct to 2 decimal places.



SOH CAH TOA

$\sin 31 = \frac{2.6}{x}$

$x = \frac{2.6}{\sin 31}$

$= 5.05$

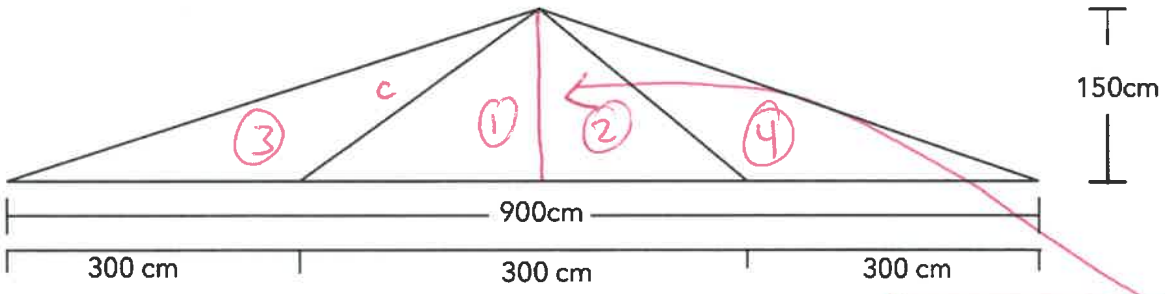
1 mark (draws picture)

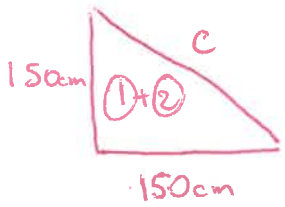
1 mark (shows working)

1 mark (answer)

Question 12 **6 *marks***

Sam builds a roof support. It is 900cm wide, 150cm tall and is supported by 4 diagonal beams. The two outer beams are the same length, and the two inner beams are the same length. How much total wood would Sam need to build their structure?



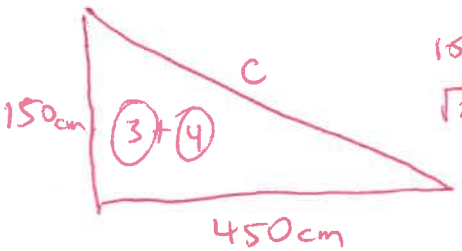


$150^2 + 150^2 = c^2 = 45000$

$\sqrt{45000} = c = 212.13$

$\approx 212\text{cm} \times 2$

$\approx 424\text{cm}$



$150^2 + 450^2 = 204750$

$\sqrt{204750} = 452.49$

$\approx 452 \times 2$

$\approx 904\text{cm}$

$900 + 424 + 904 = 2228\text{cm}$ of wood.

End of Test

Answer mark given if exact with decimals also

1 mark (draws line)

1 mark 150cm seen bottom length of split triangle

1 mark Finds length middle small triangle. crossbeam

1 mark Finds length of long cross-beam (outside triangle)

1 mark add totals found.

1 mark answer mark