−1 no/missing units

Mathematics Essentials 2016
Unit 3/4 Test 2
Task Weighting: 6%

Eastern Goldfields College

Student Name: SOLUTIONS

Time Allowed: 55 Minutes Total Marks: 42

Calculators and files are allowed in this test.

Answer all of the following questions. Show all working where appropriate to maximise marks.

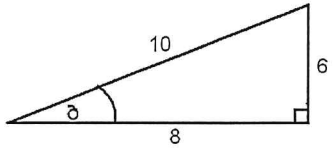
Question 1 (4 marks: 1, 1, 1, 1)

Circle the correct answer in each of the following multiple choice questions.

a) The three sides of a right-angled triangle measure 40 m, 41 m and 9 m. The length of the hypotenuse is:

(i) 9 m **(ii)** 40 m **(ii)** 41 m ✓ **(iv)** none of these

b) In relation to the angle, which is the opposite side?

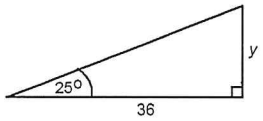


(i) 10 **(ii)** 8 **(iii)** 6 ✓ **(iv)** none of these

c) A map has a scale of 1 : 5000. 5cm on the map is equal to how far in real life?

(i) 5000 cm **(ii)** 2500 cm **(iii)** 25 m **(iv)** 250 m ✓

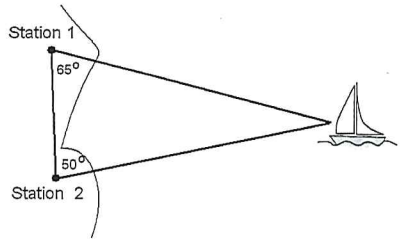
d) The value for *y* in the diagram is given by:



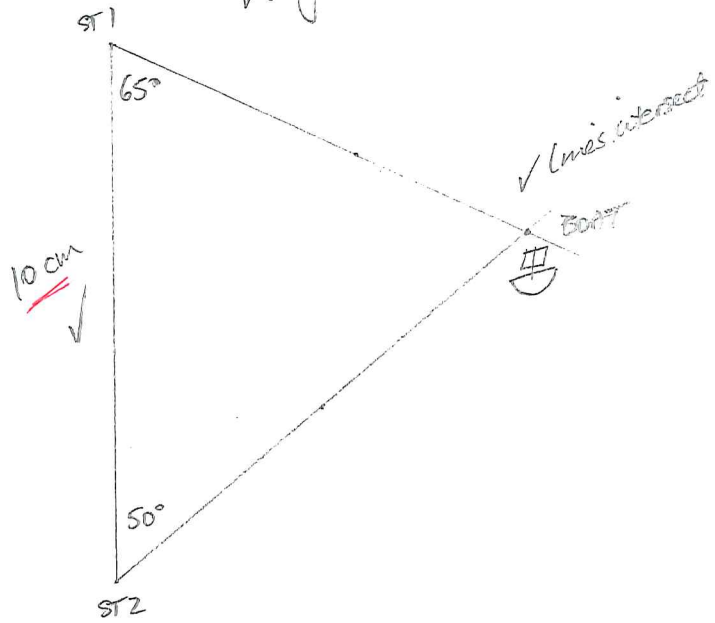
(i) $36 \times \tan 25^\circ$ ✓ **(ii)** $36 \times \cos 25^\circ$ **(iii)** $\frac{36}{\tan 25^\circ}$ **(iv)** $\frac{36}{\sin 25^\circ}$

Question 2 (6 marks: 3, 2, 1)

a) Using a ruler and a protractor, make an accurate scale drawing of the diagram on the right. The stations are 20 km apart.
Use scale 1cm = 2km



✓ angles.



b) Use your scale drawing to calculate how far the boat is from Station 1

$8.4\text{cm}^{\checkmark} \times 2 = 16.8\text{ km}^{\checkmark}$

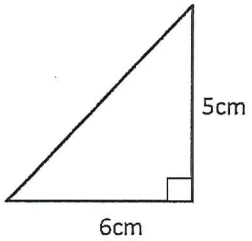
NB. Measure their lines and check for accuracy.

c) State 1cm = 2 km as a scale with no units. i.e 1 : 200 000 ✓

Question 3 (7 marks: 2, 2, 3)

For each of the triangles below, find the value of the third side, giving your answer correct to 1 decimal place.

a)



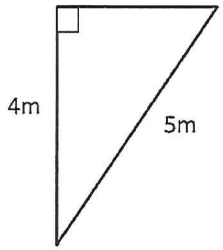
$x^2 = 5^2 + 6^2$ ✓

$x^2 = 25 + 36$

$x^2 = 61$

$x = 7.8$ cm ✓

b)



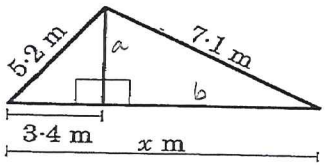
$x^2 + 4^2 = 5^2$ ✓

$x^2 = 25 - 16$

$x^2 = 9$

$x = 3$ m ✓

c)



$a^2 + 3.4^2 = 5.2^2$

$a = 3.9$ ✓

$3.9^2 + b^2 = 7.1^2$

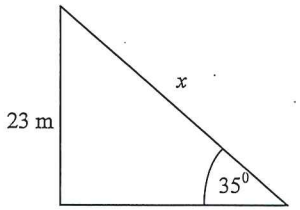
$b = 5.9$ ✓

$x = 3.4 + 5.9$

$x = 9.3$ m ✓

Question 4 (3 marks)

Find the value of x, giving your answer correct to 1 decimal place.



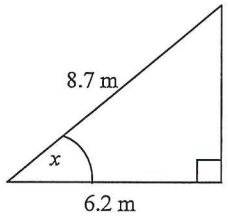
$\sin 35 = 23/x$ ✓

$x = 23 / \sin 35$ ✓

$x = 40.1$ m ✓

Question 5 (3 marks)

Find the size of the angle marked *x*, correct to the nearest degree.



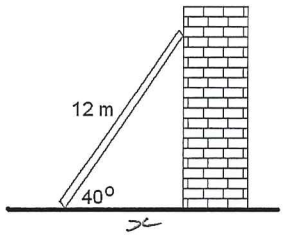
$\cos x = 6.2/8.7$ ✓

$x = 44.549\ldots$ ✓

$\therefore 45°$ ✓

Question 6 (3 marks)

A ladder 12 m long leans against a wall. If it forms an angle of 40^0 with the ground, how far is the bottom of the ladder away from the wall?



$\cos 40 = x/12$ ✓

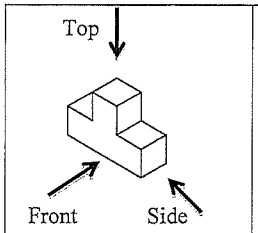
$12 \times \cos 40 = x$ ✓

$9.19 = x$

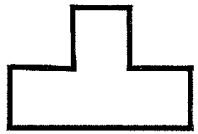
$\therefore 9.2$m ✓

Question 7 (4 marks)

Consider the diagram below. Indicate which view is given in each of the three 2D diagrams for the first shape and then draw the top, front and side views of the next shape.

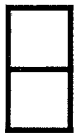


View From FRONT

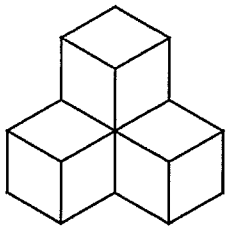


View From TOP

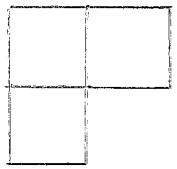
View From SIDE



✓ right/wrong.

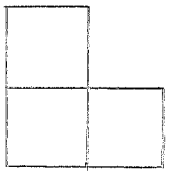


View from top



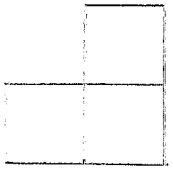
✓

View from Front



✓

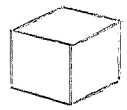
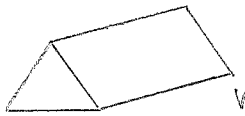
View from Side



✓

Question 8 (6 marks: 2, 2, 2)

Draw and name the following shapes, according to the descriptions given below:

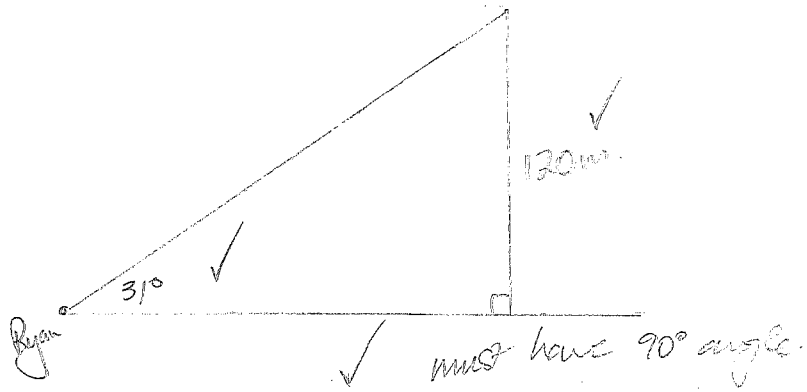
	Description	Name	Drawing
(a)	A 3D shape with 6 faces, all of which are the same size and shape.	Cube ✓	 ✓
(b)	A 3D shape that is made up of 5 faces – 2 triangles and 3 rectangles.	Triangular Prism ✓	 ✓
(c)	A 3D shape which has a single curved edge, a vertex and a circle base.	Cone ✓	 ✓

3 3

Question 9 (6 marks: 2, 2)

Ryan is sitting in a park and looks towards the top of a 120 m tall tower at an angle of elevation of 31^0.

a) Draw and label a diagram of this situation.



b) How far is Ryan sitting from the base of the tower, to the nearest metre?

$\tan 31 = \frac{120}{x}$ ✓

$x = \frac{120}{\tan 31}$

$x = 199.7$ ✓

$\therefore$ 200 m ✓

END OF TEST