



Eastern Goldfields College

-1 incorrect or missing units

Student Name _____

Eastern Goldfields College Mathematics Essential U1 2017

Test 2 – Calculator Free Section

Total Marks: 18 Marks

Time allowed: 15 minutes

No calculator or notes permitted for this section.

Answer all of the following questions. Show working where necessary.

Question 1 [3 Marks – 1, 2]

(a) Which is the correct abbreviation for 90 kilometres? ✓

90 kms or 90 km (circle the correct answer)

(b) Which unit, millimetre, centimetre, metre or kilometre, would you use to measure each of these lengths?

i. The length of your table centimetres (cm) $\frac{1}{2}$

ii. The width of a finger nail centimetres/millimetres $\frac{1}{2}$

iii. The length of a football oval metres (m) $\frac{1}{2}$

iv. The distance from Kalgoorlie to Melbourne Kilometres (km) $\frac{1}{2}$

Question 2 [7 Marks – 1, 1, 1, 1, 1, 1, 1]

Convert the following units:

a) $3 \text{ m} = \underline{300} \text{ cm}$ ✓

c) $4000 \text{ m} = \underline{4} \text{ km}$ ✓

e) $2 \text{ cm}^2 = \underline{200} \text{ mm}^2$ ✓

g) $1 \text{ m}^2 = \underline{10000} \text{ cm}^2$ ✓

b) $5.35 \text{ km} = \underline{5350} \text{ m}$ ✓

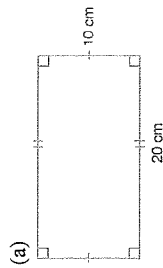
d) $23 \text{ cm} = \underline{230} \text{ mm}$ ✓

f) $3 \text{ km}^2 = \underline{300000} \text{ m}^2$ ✓

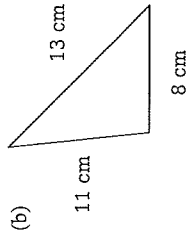
r/w

Question 3 [4 Marks – 1, 1, 1, 2]

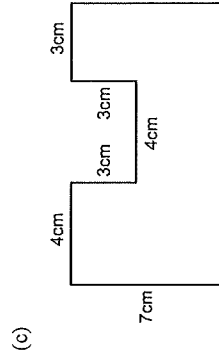
Calculate the perimeter of the following shapes:



$$P = 2 \times 20 + 2 \times 10 \\ = 60 \text{ cm} \checkmark$$



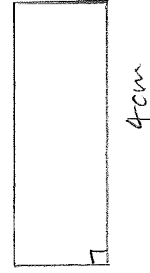
$$P = 11 + 8 + 13 \\ = 32 \text{ cm} \checkmark$$



$$P = 7 + 4 + 3 + 4 + 3 + 3 + 7 + 11 \\ = 42 \text{ cm} \checkmark$$

Question 4 [2 Marks]

Draw a possible rectangle with a perimeter of 14 cm. Clearly label the length and width.



✓ many possible solutions
3 cm (length and width total 7)

Question 5 [2 Marks]

The height of Simon's kitchen bench top is 900 mm.

a) Is this less than or more than 1 m? ✓

less than 1m ✓

b) How many centimetres difference between 900 mm and 1 m? ✓

10 cm ✓



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Test 2 – Calculator Assumed

Total Marks: 41 marks

Time allowed: 40 minutes

One A4 page of notes permitted in this section. Show working to maximise your marks.

Question 1 [8 Marks – 2, 2, 4]

- (a) John plays cricket. If John can bowl 6 balls in 5 minutes. How many balls can he bowl in $\frac{1}{2}$ hour?

$$30 \div 5 = 6 \checkmark$$

$$6 \times 6 = 36 \checkmark$$

- (b) At Coles you have a choice of buying loose potatoes or a bag of potatoes. Loose potatoes cost \$2.30/kg and a 3 kg bag of potatoes is \$7. Which is the better buy? Show your working to justify your answer.

$$2.30 \times 3 = \$6.90 \quad \checkmark \quad \text{working} \quad (\text{or } 7 \div 3 = \$2.33)$$

\therefore Loose spuds is better buy. \checkmark

- (c) James earns \$23.50 an hour and works a normal 37-hour week. In the same week, he works 10 hours overtime at time and a half and 4 hours overtime at double time how much does he earn in the week?

$$23.50 \times 37 = 869.50 \quad \checkmark$$

$$35.25 \times 10 = 352.50 \quad \checkmark$$

$$47 \times 4 = 188 \quad \checkmark$$

$$\text{Total } \$1410 \quad \checkmark \quad \text{F.T.}$$

Question 2 [5 marks - 2, 3]

Taxi fares (T dollars) have several components: flagfall (f), booking fee (b), waiting fee (w) and a 'per kilometre' charge (m).

$$T = f + b + w + 1.69m$$

The Kalgoorlie taxi company charges

\$3.00 flagfall

\$2.00 booking fee

\$9.50 for each 10 minutes (or part thereof)* of waiting time

\$1.88 per kilometre

*part thereof means you pay \$9.50 for every 10 minute block of time even if you only wait for part of it.

You only pay the booking fee if you book a taxi by telephone or online.

You only pay the waiting fee if the driver has to wait 10 minutes or more.

- a) What would be the taxi fare for a customer who hailed a taxi on Friday at 11am, hopped in straight away and travelled to an appointment 25kms away.

$$T = 3 + 1.69(25) \quad \checkmark$$

$$= \$45.25 \quad \checkmark$$

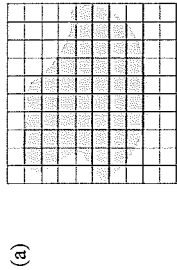
- b) Another customer booked a taxi on Thursday morning. When it arrived he asked the driver to wait. He left 28 minutes later for a journey of 32km.

$$T = 3 + 2 + 9.5 \times 3 + 1.69(32) \quad \checkmark$$

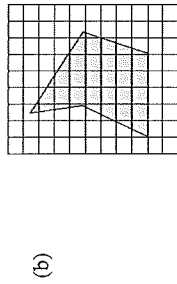
$$= \$87.58 \quad \checkmark$$

Question 3 [4 Marks - 2, 2]

Estimate the area of the following shapes each square represents 1 unit²



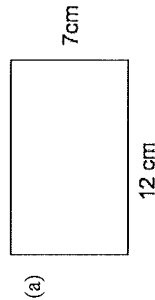
~ 49 units² ✓✓



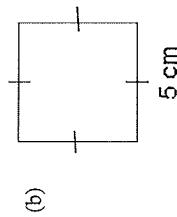
~ 27 units² ✓✓

Question 4 [7 Marks - 1, 1, 2, 3]

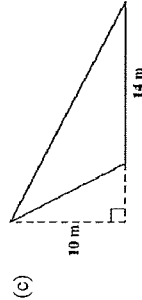
Calculate the area of the following shapes:



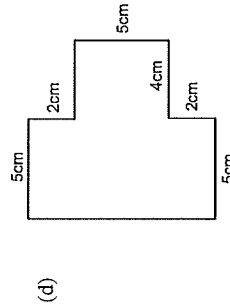
$$A = 12 \times 7 = 84 \text{ cm}^2 \checkmark$$



$$A = 5^2 = 25 \text{ cm}^2 \checkmark$$



$$A = 7 \times 10 = 70 \text{ m}^2 \checkmark$$

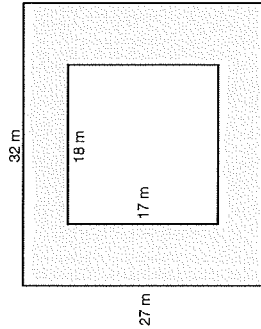


$$A = 9 \times 5 + 4 \times 5 = 90 \text{ cm}^2 \checkmark$$

(or other methods of dissection)

Question 5 [3 Marks]

Find the area of the shaded region:



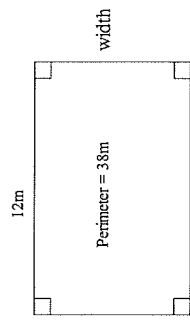
$$A = 27 \times 32 = 864 \text{ (Large)} \checkmark$$

$$A = 17 \times 18 = 306 \text{ (Small)} \checkmark$$

$$\text{Shaded Area} = 864 - 306 = 558 \text{ m}^2 \checkmark$$

Question 6 [3 Marks - 1, 2]

(a) Find the width of the given rectangle.

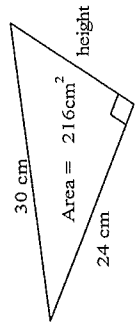


Width is 7 m ✓

$$(19 - 12)$$

r/w

(b) Find the height of the given triangle.



Height is 18 cm

$$(216 \div 12)$$

✓

Question 7 [8 marks- 2, 1, 2, 3]

- (a) Find the area of the plot of land to the right:

$$A = 10 \times 12 + 6 \times 5 \checkmark$$

$$= 150 \text{ km}^2 \checkmark$$

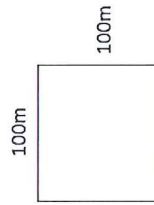
- (b) Convert the units from km^2 to m^2

$$150\,000\,000 \text{ m}^2 \checkmark$$

- (c) An acre is an old measure of land area, which equals approximately $4\,047 \text{ m}^2$. How many acres in the plot of land above? Give your answer to the nearest acre.

$$150\,000\,000 \div 4\,047 = 37\,064 \text{ acres} \checkmark$$

- (d) A hectare (ha) is a unit of area that measures 100m by 100m as shown in the diagram below.



- i) How many square meters in a hectare?

$$10\,000 \text{ m}^2 \checkmark$$

- ii) How many acres are in a hectare? Give your answer to 1 d.p.

$$10\,000 \div 4\,047 \checkmark$$

$$= 2.5 \text{ acres} \checkmark$$

Question 8 [4 marks - 3, 1]

- (a) A paving brick measures 230 mm long and 115 mm wide. Show, using calculations, how approximately 38 pavers will be needed to cover 1 m^2

$$1 \text{ m}^2 = 1\,000\,000 \text{ mm}^2$$

$$1\,000\,000 \div 26\,450 \checkmark$$

$$= 37.8 \checkmark \text{ approx } 38$$

$$230 \times 115 \text{ (Brick)}$$

$$= 26\,450 \text{ mm}^2 \checkmark$$

- (b) How many pavers will be needed to cover an area of 120 m^2 .

$$120 \times 38$$

$$= 4\,560 \text{ pavers} \checkmark$$

END OF TEST