Student Name _____

Eastern Goldfields College
Mathematics Essential U1 2018
Test 2 – Calculator Free Section

Total Marks: 21 Marks

Time allowed: 15 minutes Weighting 9% Marking Key

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 maths book _____cm_____ ✓✓ total

ii. The width of a finger nail _____mm_____ ½ mark each

iii. The length of a football oval _____m_____

iv. The distance from Kalgoorlie to Melbourne _____km_____

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

Convert the following units:

a) 3 m = 300 cm ✓

b) 5.35 km = 5350 m ✓

c) 4000 m = 4 km ✓

d) 23 cm = 230 mm ✓

e) 2 cm^2 = 200 mm^2 ✓

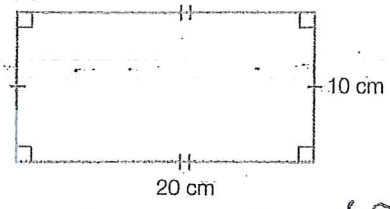
f) 3 km^2 = 3 000 000 m^2 ✓

g) 1 m^2 = 10 000 cm^2 ✓

Question 3 [4 Marks – 1, 1, 2]

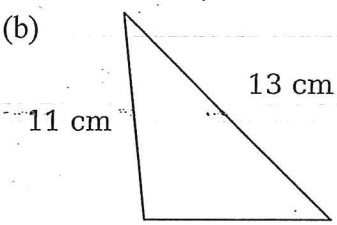
Calculate the perimeter of the following shapes:

(a)



$P = 2(20+10) = 60\text{cm}$ ✓

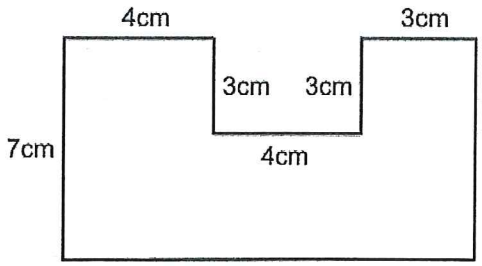
(b)



$P = 11 + 13 + 8$

$= 32\text{ cm}$ ✓

(c)



$P = 7+4+3+4+3+3+7+11$ ✓

$= 42\text{ cm}$ ✓

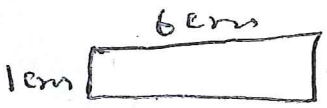
Question 4 [2 Marks]

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

$14 = 2(L+W)$

$7 = L+W$

L	W
1	6
2	5
3	4



✓ Drawing

✓ sides add up to 7

eg. 0.5 and 6.5

Question 5 [3-2, 1 Marks]

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

a) Is this less than or more than 1 m? Explain your answer

$900\text{mm} = 0.9\text{m}$ ✓

It is less than 1m ✓ Decision

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

$100\text{cm} - 90\text{cm} = 10\text{cm}$ ✓

Question 6 [2 marks]

At a local service station, unleaded petrol sells for 150 cents per litre. How much would it cost to buy 3 litres? Express your answer in dollars.

$150\text{c} \times 3 = 450\text{c} = \$4.50$ ✓ ✓

Student Name _____

Eastern Goldfields College
Mathematics Essential U1 2018
Test 2 – Calculator Assumed

Total Marks: 42 marks

Time allowed: 40 minutes

marking key

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 ½ hour?

½h = 30min , $\frac{30}{5}$ = 6 , 6 x 6 = 36 balls

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

$7 ÷ 3kg = $2.33 per kg

$2.30 per kg < $2.33 per kg

so loose potatoes are cheaper

(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 plus 4 hours overtime at double time. How much does he earn in the week?

Pay = ($23.50 x 37) + (10 x 1.5 x $23.50) + (4 x 2 x 23.5

= $869.50 + $352.50 + $188

= $1410

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**).

$$\mathbf{T = f + b + w + 1.69m}$$

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 25 kms away.

$b = 0$, $w = 0$, $m = 25\text{km}$

$T = f + 1.69m$

$= \$3 + \$1.69 \times 25$ ✓

$= \$3 + \$42.25$

$= \$45.25$ ✓

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 32 km.

$f = 3$, $b = 2$, $w = \frac{28}{10} \times \$9.50$, $w \approx 3 \times 9.50 =$

$= \$28.50$ ✓

$T = 3 + 2 + 28.50 + 1.69 \times 32$ ✓ FT if w is wrong.

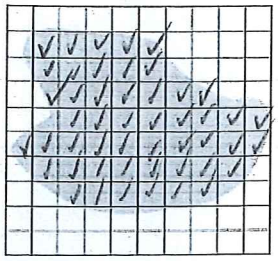
$= 33.5 + 54.08$

$= \$87.58$ ✓

Question 3 [4 Marks – 2, 2]

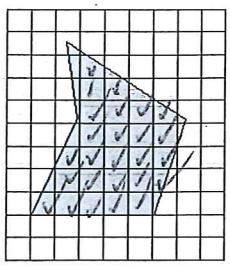
Estimate the area of the following shapes each square represents 1 unit^2.

(a)



A = 49 units^2 ✓✓

(b)

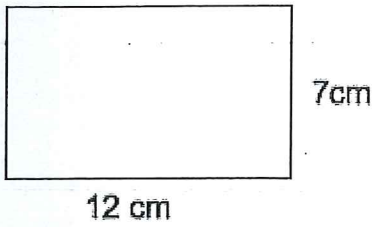


A = 26 units^2 ✓✓

Question 4 [7 Marks – 1, 1, 2, 3]

Calculate the area of the following shapes.

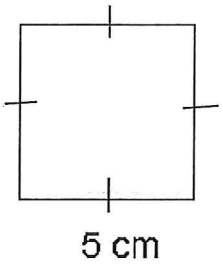
(a)



A = 12cm x 7 cm

= 84 cm^2 ✓

(b)



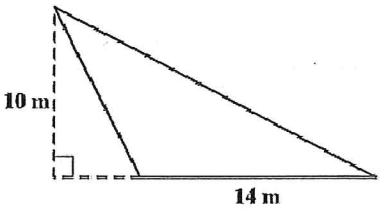
A = L x L

= L^2

= 5^2

= 25cm^2 ✓

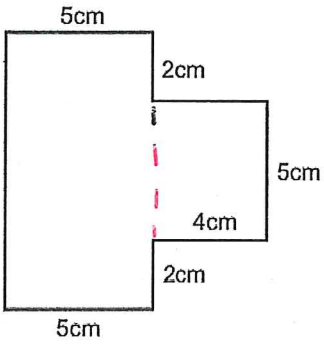
(c)



A = $\frac{1}{2}$ x 14m x 10m ✓

= 70m^2 ✓

(d)

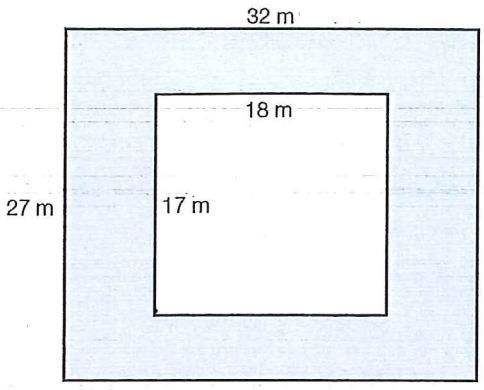


A = 9 x 5 + 4 x 5 ✓✓ 0.6 other methe

= 45 + 20

= 65 cm^2 ✓

Question 5 [3 Marks]
Find the area of the shaded region:

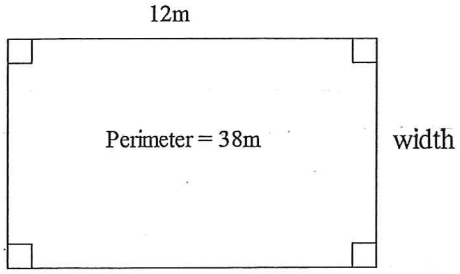


$A = (32 \times 27) - (17 \times 18)$

$= 544 - 306$

$= 238\ m^2$

Question 6 [3 Marks – 1, 2]
(a) Find the width of the given rectangle.



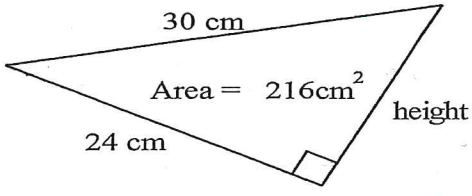
$38 = 2(12 + W)$

$19 = 12 + W$

$W = 19 - 12$

$= 7m$

(b) Find the height of the given triangle.



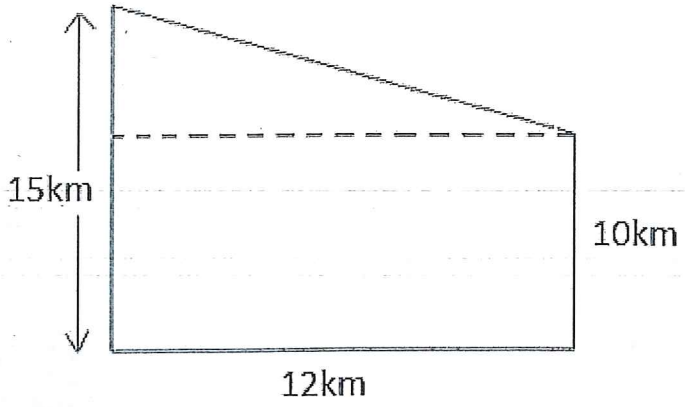
$216 = \frac{1}{2} \times 24 \times h$

$\frac{216}{12} = h$

$h = 18cm$

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

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



$A = \frac{1}{2}(15 + 10) \times 12$ ✓

$= 150 km^2$ ✓

05 $A = (12 \times 10) + \frac{1}{2} \times 5 \times 12$

$= 120 + 30 = 150 km^2$

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

$km^2 = 1km \times 1km$

$= 1000m \times 1000m$

$= 1\,000\,000 m^2$ ✓

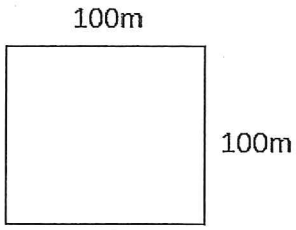
(c) An acre is an old measure of land area, which equals approximately 4 047m^2. How many acres in the plot of land above? Give your answer to the nearest acre.

$150 km^2 = 150\,000\,000 m^2$

$= \frac{150\,000\,000}{4047} = 37\,064.49$ acres

$\approx 37\,065$ acres

(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?

$100m \times 100m = 10\,000 m^2$ ✓

ii) How many acres are in a hectare? Give your answer to 1 decimal place.

$\frac{10\,000}{4047} = 2.47 \approx 2.5$ acres ✓ ✓ rounded

Working

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

$L = 0.23m$, $W = 0.115$

$A = 0.23 \times 0.115 = 0.02645 m^2$ ✓

$\frac{1}{0.02645} = 37.8 \approx 38$ pavers ✓ ✓

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

$38 \times 120 = 4560$ pavers ✓

END OF TEST