−1 incorrect or no units

Mathematics Essentials 2015
Test 3
Task Weighting: 10%

Eastern Goldfields College

Student Name: 'SOLUTIONS'

Time Allowed: 60 Minutes Total Marks: 60

Calculators and files are allowed in this test.
Answer all of the following questions. Show all working to maximise marks.

Question 1 [4 Marks: 1, 1, 1, 1]

a) If carrots cost $2.76 per Kilogram what is the cost of 5 kg?

$2.76 \times 5 = \$13.80$ ✓

b) How many kgs can be bought for $18?

$18 \div 2.76 = 6.52\text{ kg}$ ✓ accept 6.5 kg

c) If I can jog at 10km/hr how long would it take to jog 5 km?

½ hr or 30 mins ✓

d) How far would I go in 6 minutes?

1 Km ✓

Question 2 [4 marks – 2, 2]

A taxi charges $2.50 plus $1.90 for each km travelled, how much would it cost if you travelled:

a) from to Kalgoorlie to Coolgardie which is 39 km?

$2.50 + 1.9 \times 39 = \$76.60$ ✓ ✓

b) If I had $20, how many whole kilometres could I travel?

$20 - 2.50 = 17.50$

$17.50 \div 1.9 = 9$ Km ✓✓

Question 3 [8 Marks – 2, 1, 1, 2, 1, 1]
The results from a survey on phone ownership are displayed in the two-way table below:

Mobile Phone Owners.

Type of Phone	Male	Female	Total
iPhone	36	50	86
Samsung	22	45	67
Total	58	95	153

√√

−1 per error F.T.

a) Complete the above table.

b) How many people own an iPhone?

86 ✓

c) How many males own a Samsung phone?

22 ✓

d) What percentage of males own an iPhone? (Round your answer to the nearest whole number)

$36/58 \times 100 = 62\%$ ✓ ✓

e) What fraction of females own a Samsung? (Simplify your answer if possible)

$45/95 = 9/19$ ✓

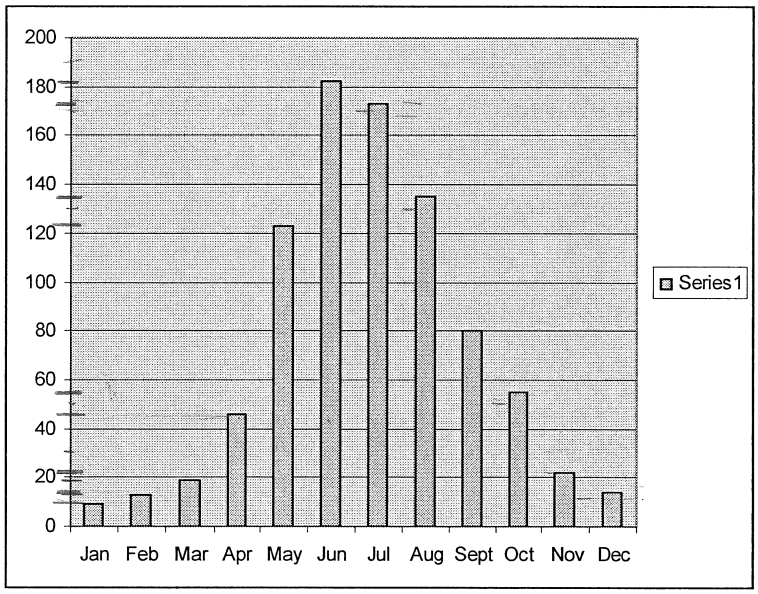
f) Would a line graph be suitable to display this data? Explain why or why not.

No as not time series or similar data or continuous

½ ½

Question 4 [5 Marks – 1, 1, 1, 2]

The column graph below shows the **average monthly rainfall** in Perth, in mm.



a) Which month had the highest average monthly rainfall?

June ✓

b) Which month had the lowest average monthly rainfall?

January ✓

c) What was the average monthly rainfall for April?

45 ✓

d) Estimate the total rainfall for the year? (9+13+19+45+123+182+172+135 +80+55+22+14)

867 (accept 865 – 870) ✓✓

Question 5 [8 marks: 2, 1, 1, 1, 1, 2]

The formulae for Basic Metabolic Rate are below, giving the result in calories. The weight is measured in kilograms and the height measured in centimetres.

Calories can be converted to kilojoules by multiplying by 4.182

Female BMR = 655 + (9.6 x weight) + (1.8 x height) – (4.7 x age) calories
Male BMR = 66 + (13.7 x weight) + (5 x height) – (6.8 x age) calories

Calculate the BMR (in kilojoules) for the following people, showing all your working.

a) A 17 year old male, 172cm tall, weighing 58kg.

$66+(13.7\times 58)+(5\times 172)-(6.8\times 17)$ ✓
$= 1605$ cals ✓ $1605\times 4.182 = 6712.11$ kj

b) A 17 year old female, 172cm tall, weighing 58kg.

$655+(9.6\times 58)+(1.8\times 172)-(4.7\times 17)$
$= 1441.5$ cals $1441.5\times 4.182 = 6028.353$ kj ✓

c) A 54 year old male, 178cm tall, weighing 73kg.

$66+(13.7\times 73)+(5\times 178)-(6.8\times 54)$
$= 1588.9$ cals $1588.9\times 4.182 = 6644.7798$ kj ✓

d) An 80 year old female, 168cm tall, weighing 60kg.

$655+(9.6\times 60)+(1.8\times 168)-(4.7\times 80)$
$= 1157.4$ $1157.4\times 4.182 = 4840.2468$ kj ✓

e) Compare BMR for males and females. What do you notice?

It is greater for males ✓

f) What happens to BMR as people get older? Explain what aspect of the formula causes this.

It decreases ✓ → the final $-(4.7\times \text{age})$
A larger amount is being subtracted
as the person ages. ✓

Question 6 [5 marks: 3, 2]

Tom has a resting heart rate of 64 beats per minute. How many times would his heart beat in:

a) i) 1 hour = 3840 ✓ (64 x 60)

ii) 1 day = 92160 ✓ (3840 x 24)

iii) 1 year = 33638400 ✓ (92160 x 365)

b) An average of 70 ml are pumped from the heart each heartbeat.

How much blood is pumped by your heart in :

i) 1 day 6451200 ml (92160 x 70)

ii) 1 year 2354688000 ml (6451200 x 365)

Question 7 [4 marks: 2, 2]

Your maximum heart rate can be calculated 2 ways:

Method 1 Max Heart Rate = 220 – your age

Method 2 208 – 0.7 X your age

If a person was 56 years old what would their maximum heart rate be, using both methods

Method 1 220 − 56 = 164 bpm ✓

Method 2 208 − 0.7 x 56 = 168.8 ~ 169 bpm ✓

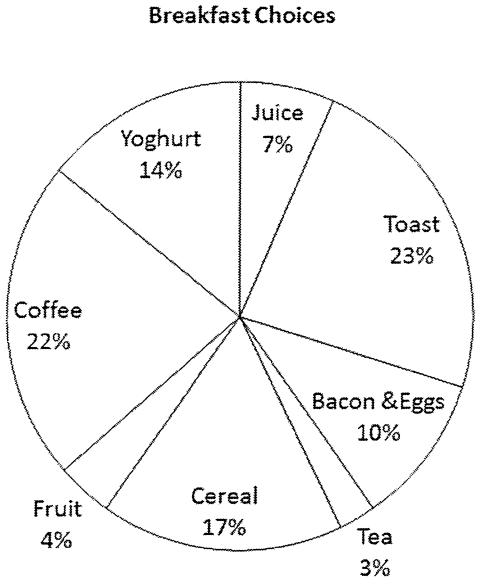
The **target heart rate** for an aerobic workout varies, but as a guide should be between 50% and 75% of your maximum heart rate. Rounding your answers to the nearest whole number, use Method 1 to calculate the range of this person's target heart rate.

∴ 82 bpm ✓ and 123 bpm ✓

(50% of 164) (75% of 164)

Question 8 [5 marks: 1, 1, 2, 1]

The pie graph below displays food choices for breakfast from a group of 77 people.



a) What was the most popular breakfast item? Toast ✓

b) What was the least popular breakfast item? Tea ✓

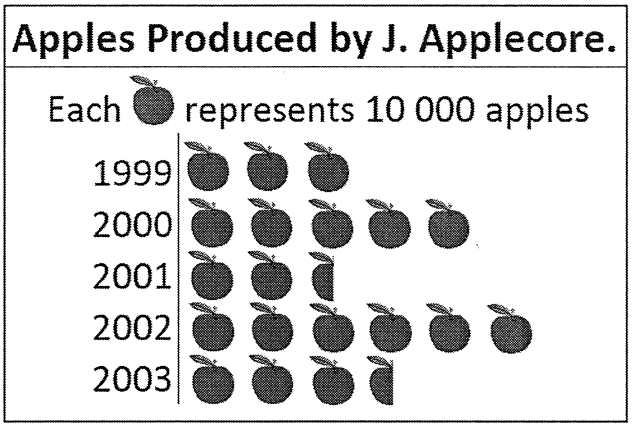
c) How many people chose cereal as their favourite breakfast food? $0.17 \times 77 = 13$ ✓ ✓

d) If 100 people had been surveyed what fraction (simplest form) would have chosen fruit as their favourite?

$\frac{4}{100} = \frac{1}{25}$ ✓

Question 9 [10 marks: 1, 1, 1, 1, 1, 2, 1, 2,]

John Applecore began his apple orchard in 1996. The first apples were picked in 1999. The graph below shows the harvest for 5 years.



a) What kind of graph is this? Pictograph / pictogram ✓

b) In which year was the harvest greatest? 2002 ✓

c) What was the harvest in 2003? 35000 apples ✓

d) What was the harvest in 1996? 0 ✓

e) Which year did the harvest increase most over the previous year? 2002 ✓

f) What percentage of the apples produced up to 2000, were picked in 1999?

(3/8) 30000/80000 ✓ x100 = 37.5% ✓

g) How many apples were produced in the first five years? 80000 apples ✓

h) In 2003 John paid Julie 20 cents per apple to pick the complete harvest. How much was she paid?

35000 x 0.2 = $7000 ✓

✓

Question 10 [1 mark]

Which type of graph would be best suited for the following data:

Colour Preference	Blue	Red	Green	Yellow
Number of Students	120	196	215	95

Column graph or pie graph. ✓
(possibly pictograph).

Question 11 [2 marks]

Lily is using a recipe that **serves 4 people**. She is adapting the recipe for **8 people** and has calculated the amount of butter she needs.

Original Recipe → 250 g butter New Recipe → 250 x 8 = 2000g →2 kg

Lily has made a mistake. Check her working and explain where she has made the mistake and correct it to show how much butter she needs to serve 8 people.

Should have multiplied by (2) instead of 8 ✓

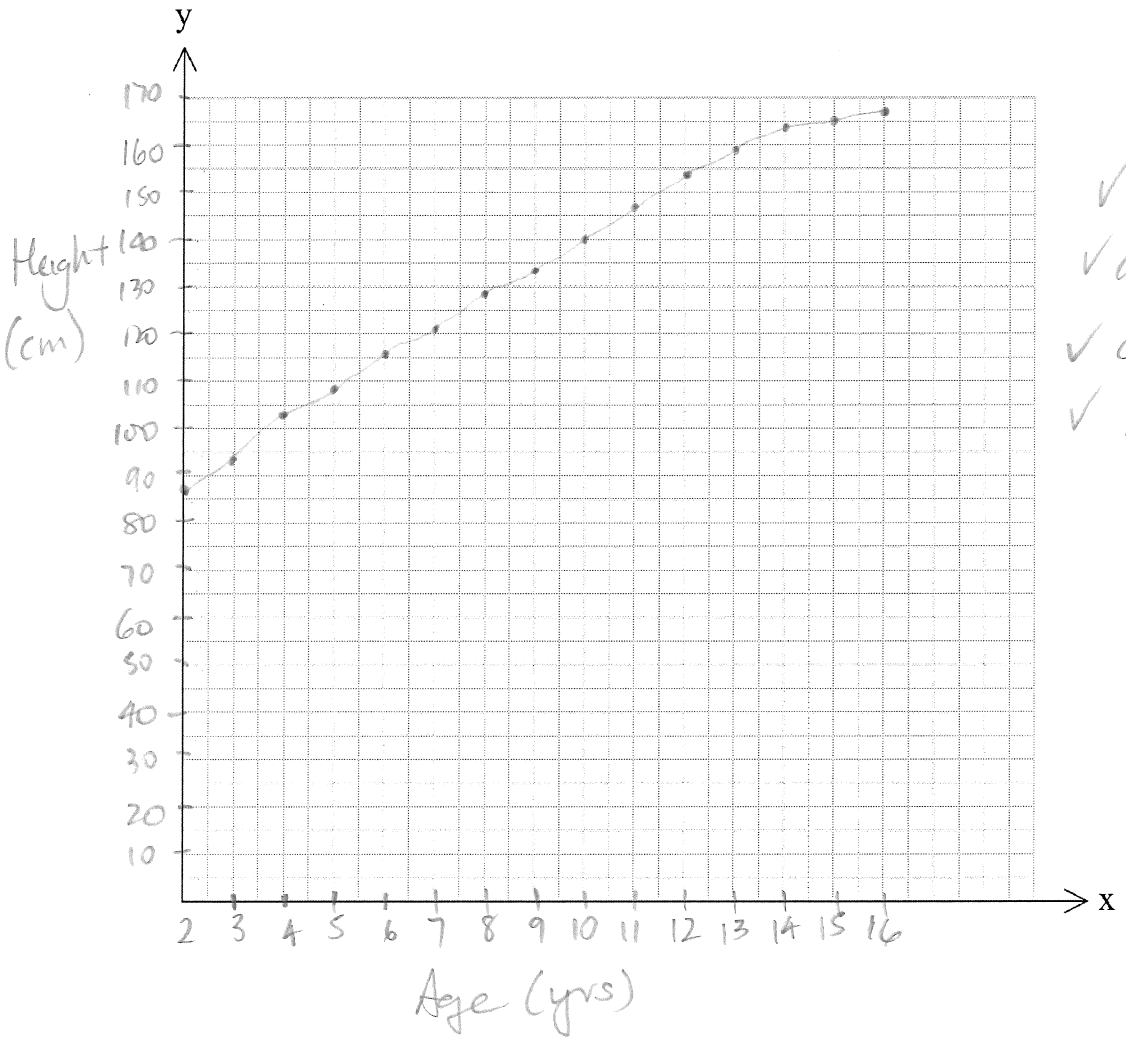
250 x 2 = 500g ✓

Question 12 [4 marks]

Use the grid below to graph the following information.

Tanya's height at each birthday from 2 to age 16 are given below, each height being measured to the nearest centimetre.

Age in years	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Height (cm)	86	94	103	108	115	121	128	133	140	147	154	158	163	165	166



✓ scale (consistent)
✓ axes labelled
✓ accurate plot
✓ Age on horizontal Height vertical