−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)

$45/95 = 9/19$ ✓

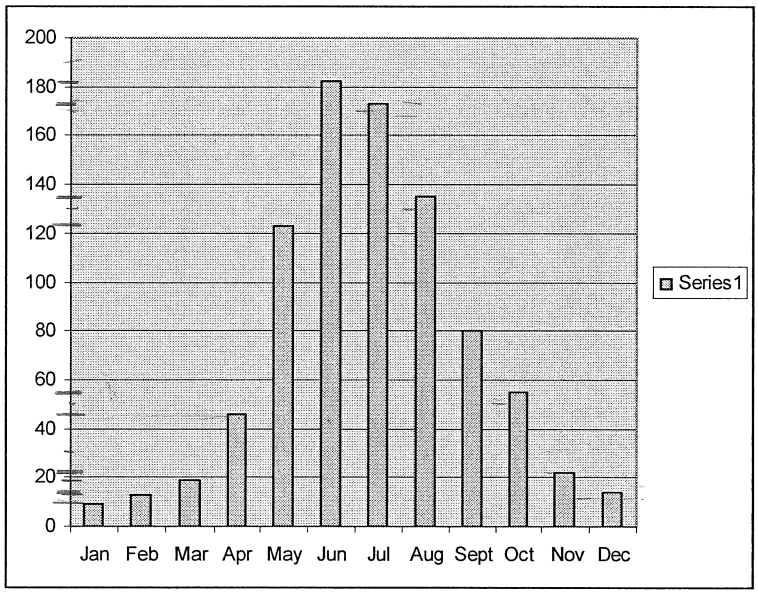
f) Would a line graph be suitable to display this data? Explain why or why not.

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 ✓

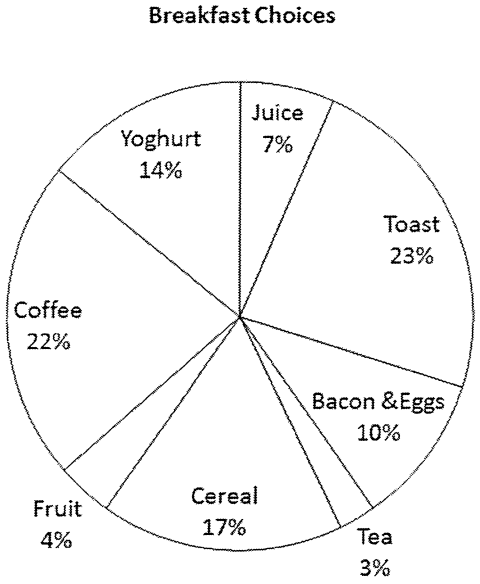
The **target heart rate** for an aerobic workout varies, but as a guide should be between 50% and 75% of your maximum heart rate. Rounding your answers to the nearest whole number, use Method 1 to calculate the range of this person's target heart rate.

∴ 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 ✓

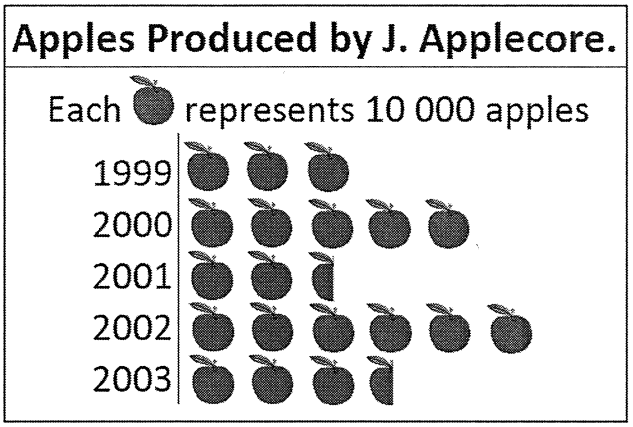
c) How many people chose cereal as their favourite breakfast food? $0.17 \times 77 = 13$ ✓ ✓

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 ✓

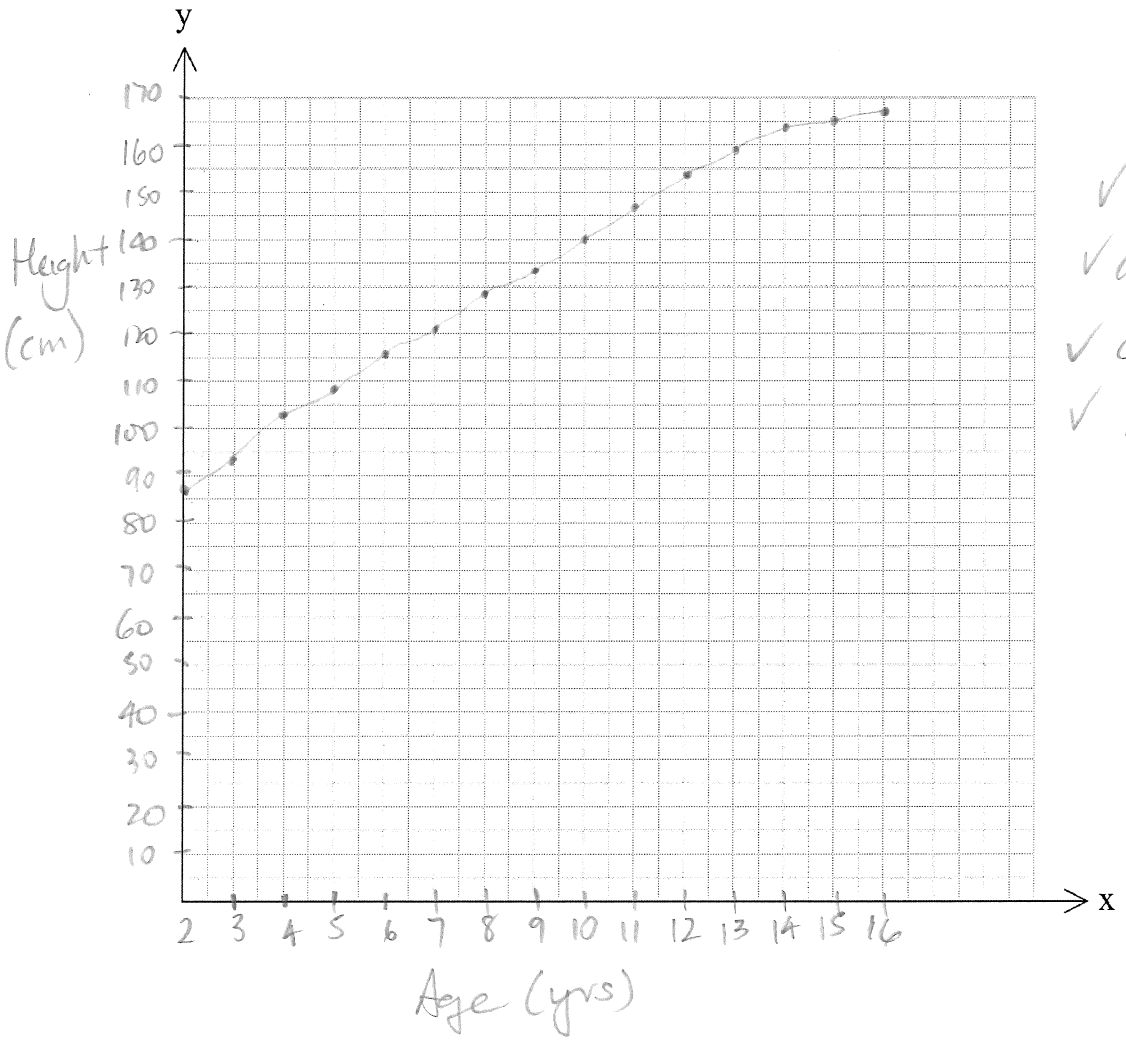
250 x 2 = 500g ✓

**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