Student Name _____

Eastern Goldfields College
Mathematics Applications 2015
Test 4 (U2 T1) – Calculator Free

Total Marks: 26 marks

Time allowed: ~~25~~ 22 minutes

No calculator or notes permitted for this section.

Answer all of the following questions. Show all working to obtain full marks.

Question 1 (5 marks: 1, 1, 1, 1, 1)

Using the **four** classifications listed below, classify each of the following variables and identify the best way to display them.

Classifications:

- Categorical and nominal
- Categorical and ordinal
- Numerical and discrete
- Numerical and continuous

	Data Classification		Data Display	
Gender	Cat - Nom	½	Col/Bar or Pie	½
Number of Children	Num - Disc	½	Dot-freq	½
Finishing position in a 100 m race	Cat - Ord	½	table	½
Height	Num - Cont	½	Histogram	½
Height to the nearest cm	Num - Disc	½	Dot freq or Stem-Leaf	½

Question 2 **(7 marks: 1, 2 , 2, 2)**
Solve the following equations:

a) $2x - 6 = 14$

$+6$

$\frac{2x}{2} = \frac{20}{2}$

$x = 10$ ✓R/W

b) $3(6 - 2x) = 28$

$18 - 6x = 28$

$-18 \quad -18$

$-6x = 10$ ✓✓ -1 ∃ error

$x = \frac{-10}{6} = \frac{-5}{3} = -1\frac{2}{3}$

c) $\frac{3x}{10} = \frac{2}{5}$ ✓✓ -1 ∄ error

$15x = 20$

$x = \frac{20}{15} = \frac{4}{3} = 1\frac{1}{3}$

d) $\frac{5}{x} = \frac{40}{1}$

$5 = 40x$

$x = \frac{5}{40} = \frac{1}{8}$ ✓✓ -1 ∄ error

Question 3 **(6 marks: 2, 4)**

(a) The mean height of a sports team is 182 cm. One of the players who is 172 cm tall leaves the team. Will the mean height increase, decrease or remain the same. Justify your answer.

increase ✓ ∵ majority of players are taller than him/her. ✓ $\bar{x}$

(b) The whole numbers below are arranged in ascending order and have a mean of 6.

1, 3, a, 6, 7, b, 9, 10

Determine all the possible values for a and b.

$6 = \frac{1+3+a+6+7+b+9+10}{8}$

✓ $48 = 36 + a + b$.

✓ $12 = a + b$.

$a = 3, \quad b = 12 - 3 = 9$

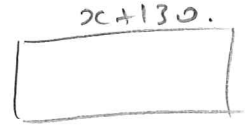
or $a = 4 \quad b = 8$

or $a = 5 \quad b = 7$

} if list all ✓✓ OR if 1/2 ✓

Question 4 **(4 marks: 1, 2, 1)**

A rectangular field is x metres wide and $x + 130$ metres long. The perimeter of the field is 520 metres.



(a) Write an equation in terms of x for the perimeter of the field.

Accept any of following: $x + x + 130 + x + x + 130 = 520$ ✓

or $2(x + x + 130) = 520$

or $2(2x + 130) = 520$

or $4x + 260 = 520$.

(b) Use your equation to solve for x.

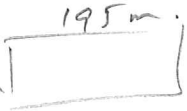
$x = 65$ m ✓✓ f.t. their eqn provided solved correctly

−1 ∄ error.

(c) What are the dimensions of the field.

width: $x = 65$ m

length: $65 + 130 = 195$ m



✓R/W.

−1 units. over paper

Question 5 **(4 marks: 1, 1, 2)**

Paula had n marbles and Stephen had 11 less than Paula. Together they had 61 marbles

(a) Write an expression for the total number of marbles Stephen had.

$n - 11$ ✓R/W.

(b) Write an expression for the total number of marbles.

$n + n - 11$ ✓R/W.

(c) ~~If they had a total of 61 marbles, write an equation and calculate the number of marbles Paula had.~~ Using your expressions from (a) + (b), write an equation if ~~they both had a total of 61 marbles and~~ calculate the number of marbles Paula had.

$n + n - 11 = 61$ ✓eqn R/W.

$2n - 11 = 61$

$2n = 72$

$n = 36$ Paula had 36 marbles ✓R/W.

End of Non-Calculator Section

Student Name _____

Eastern Goldfields College
Mathematics Applications 2015
Test 4 (U2 T1) – Calculator Assumed

Total Marks: 34 marks

Time allowed: 35 minutes

Calculator and 1 x double sided A4 notes permitted for this section.

Answer all of the following questions. Show all working to obtain full marks.

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

Jeremy sells sausages in bread outside Bunnings on Sundays. The number of sales each day over 30 Sundays was recorded as follows:

66	64	28	93	47	110	53	68	117	43
72	68	84	103	59	82	78	61	104	79
51	63	112	81	79	94	42	57	83	100

a) Draw a stem-and-leaf plot to represent this data

2	8
3	
4	2 3 7
5	1 3 7 9
6	1 3 4 6 8 8
7	2 8 9 9
8	1 2 3 4
9	3 4
10	0 3 4
11	0 2 7

√√ -1 Ferror

b) On what percentage of days did Jeremy have more than 50 sales?

$\frac{26}{30} = 86.7\%$ (1dp) √√ r/w no FT.

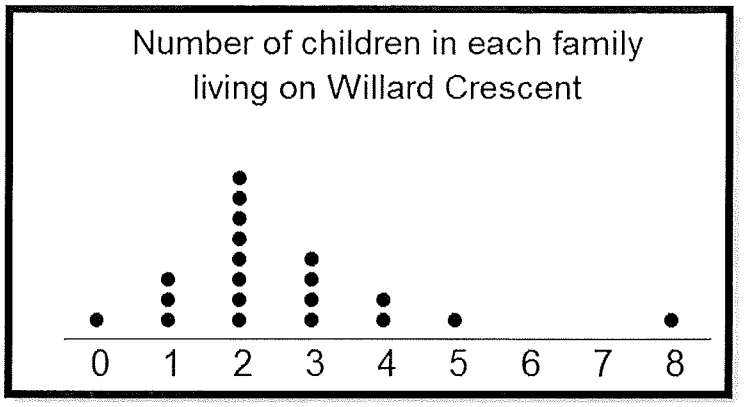
c) What is the outlier? Give one possible reason for this outlier?

28 √ Hot day ∴ less sales √

Any reasonable answer eg: → Event (eg show) on ∴ less people going to Bunnings ∴ less sales.

Question 2 **(9 marks: 1, 2, 1, 1, 2, 2)**

This dot plot shows the number of children in each family living on Willard Crescent.



a) How many families live on Willard Crescent?

20 ✓ R/U

b) Calculate the mean number of children per family.

$\bar{x} = \frac{52}{20} = 2.6$ ✓✓ R/U

c) What is the outlier?

8 ✓ R/U

d) Without re-calculating the mean, how is the mean affected if the outlier is removed from the data set?

decrease ✓ R/U

e) Give two reasons why the mean is not a good measure of centre for this data.

cannot have 0.7 of a child ✓

outlier impacts ✓

any reasonable answer

f) An extra family moved into Willard Crescent, increasing the mean number of children to 3. Considering all the original data (including the outlier), how many children did the new family have?

$3 = \frac{52 + x}{21}$ ✓

$x = 11$ children ✓

Question 3 **(2 marks)**

The mean of seven scores is 53. If six of the scores were 60, 50, 37, 60, 55 and 32, find the seventh score.

$53 = \frac{60 + 50 + 37 + 60 + 55 + 32 + x}{7}$ ✓

$371 = 294 + x$

$x = 77$

7th score = 77 ✓

Question 4 **(12 marks: 3, 1, 2, 2, 2, 2)**

The birth weights, in kilograms, of **12 baby girls** are listed in ascending order below:

2.95, 3.00, 3.03, 3.06, 3.07, 3.10, 3.15, 3.25, 3.29, 3.41, 3.45, 3.49

(a) For these 12 weights, determine

(i) the mean

$\bar{x} = 3.1875$ ✓✓ A1/A1

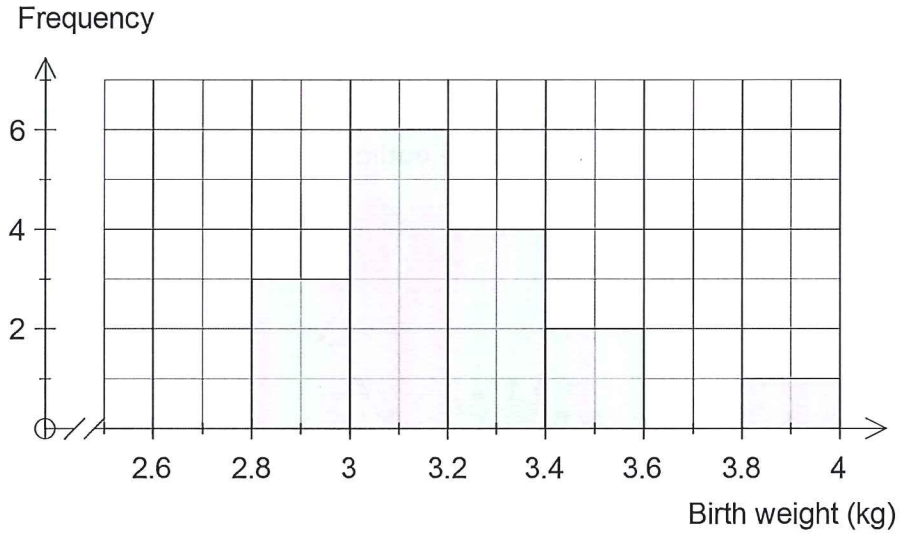
(ii) the median

med = 3.125 ✓ A1/A1

(b) Briefly explain why the mode is not a suitable measure for indicating central location for this data.

There is no mode
∴ not suitable ✓

The histogram below shows the birth weights of **16 baby boys**.



(c) Describe the spread of the weights of the 16 baby boys.

- five skewed
- modal class 3-3.2 kg
- gap / no births with weight 3.6-3.8 kg.

Range 4-2.8 = 1.2

✓✓ 1 ∃ correct. must use numbers retrospect

(d) Use the information on the previous page to complete the frequency table below for the **combined weights of all 28 babies**.

Boys + Girls.

Weight (kg)	Frequency
$2.6 < w \leq 2.8$	0
$2.8 < w \leq 3.0$	5
$3.0 < w \leq 3.2$	11
$3.2 < w \leq 3.4$	6
$3.4 < w \leq 3.6$	5
$3.6 < w \leq 3.8$	0
$3.8 < w \leq 4.0$	1

✓✓

(e) Estimate the mean weight of all 28 babies using the frequency table.

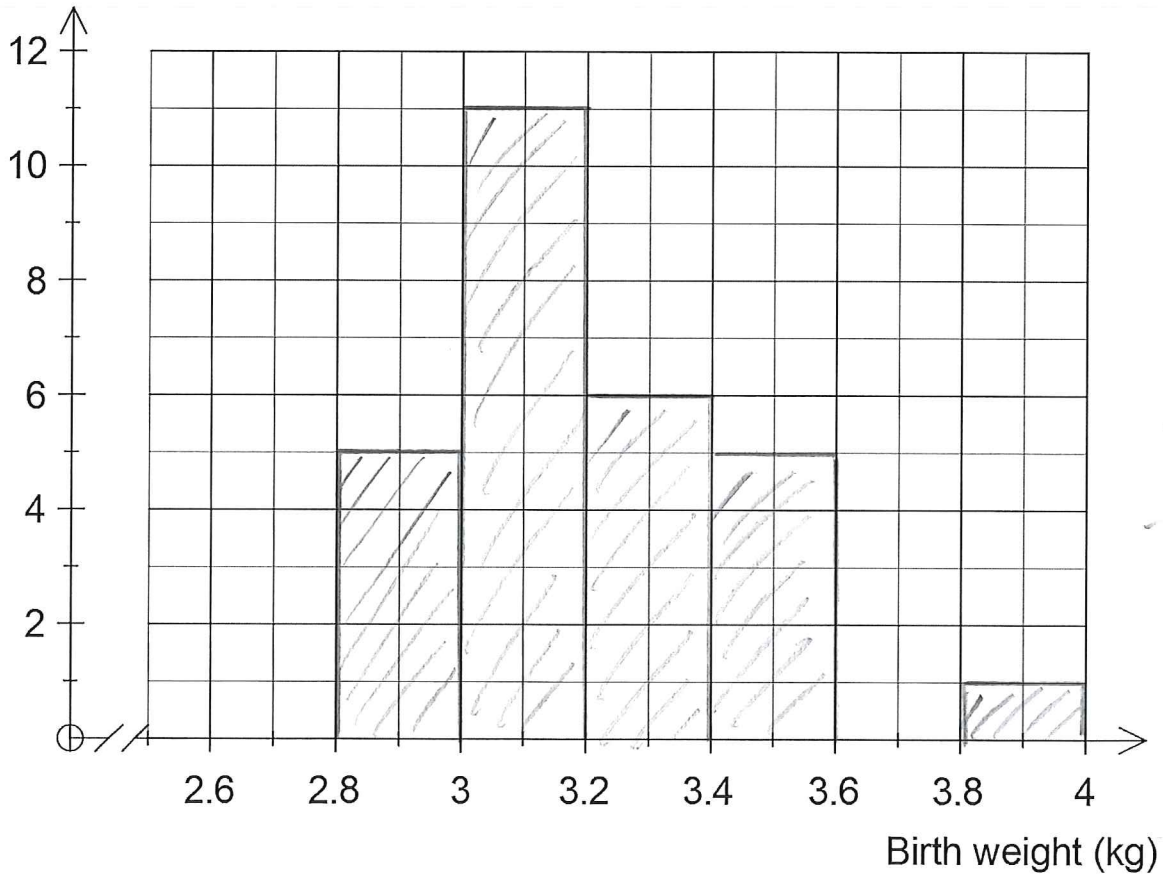
$\bar{x} \approx 3.2071429$

≈ 3.2 kg (1 dp)

✓✓ R/W
f.t. from (d)

(f) Use the frequency table in (d) to construct a frequency histogram on the axes below.

* Must use ruler
* Must be accurate f.t. from (d)



✓✓
-1 E error

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

Two classes, class A and class B, sit the same test and the combined mean is 72%. Class A has 50 students in it and the class mean is 69%. Class B has a class mean of 78%

a) Determine the total of the scores for class A.

$69 = \frac{\Sigma x}{50}$

$\Sigma x_A = 3450\%$ ✓

b) Write an expression to determine the total of the scores for class B, where x represents the number of students in class B.

$78 \times x$ ✓

or $78x$

c) Using the combined mean of 72%, write an equation to determine the number of students for class B.

$72 = \frac{3450 + 78x}{50 + x}$ ✓✓

d) Determine the total number of students for class B.

$x = 25$ students in class B. ✓

End of Calculator Section