Student Name SOLUTIONS

Eastern Goldfields College
Mathematics Essentials 2015
Investigation 5 – Road Fatalities

DUE DATE: _____ **TOTAL MARKS:** 80

This is a 4 lesson investigation worth 20% of your mark.

PART A: Comparing Total Fatalities across all States of Australia

Question 1 (8 marks: 4, 4)

−1 if no totals per table.
−1 per error

Collate the data from **2010** (Jan) into the table below.

State	Driver	Passenger	Motorcycle	Bicycle	Motorcycle Passenger	Pedestrian	Total
ACT							0
NSW	38	19	10	3	2	3	29
NT	1						1
Qld	9	1	1			1	9
SA	4	3	2	1			11
Tas	1		1		1		3
Vic	6	4	1	1		1	15
WA	3	1	2				7
TOTAL	38	19	10	3	2	3	75

Collate the data from **2015** (Jan) into the table below.

State	Driver	Passenger	Motorcycle	Bicycle	Motorcycle Passenger	Pedestrian	Total
ACT							0
NSW	37	13	19	1	0	5	29
NT							0
Qld	2	3	5			2	12
SA	4 ✓	2 ✓	2 (2)	1 ✓			9
Tas	2 ✓		1 (1)				3
Vic	6	3	2				15
WA	4		2			1	7
TOTAL	37	13	19	1	0	5	75

Question 2 (1 mark)

Why would someone put this data into a table?

✓ any of these

Much easier to read and calculate totals / to compare states / to organise/sort

Question 3 (2 marks)

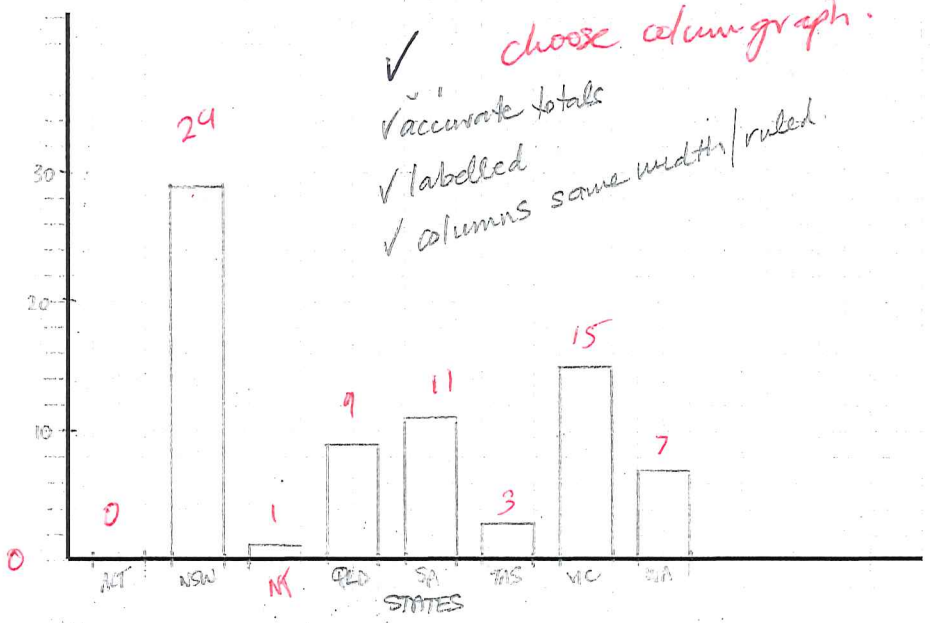
Give 2 reasons why the government would collect this data?

✓ To see if road safety campaigns are working
✓ To see if/how behaviour on roads is changing
To see speed limits where accidents are occurring
age group.

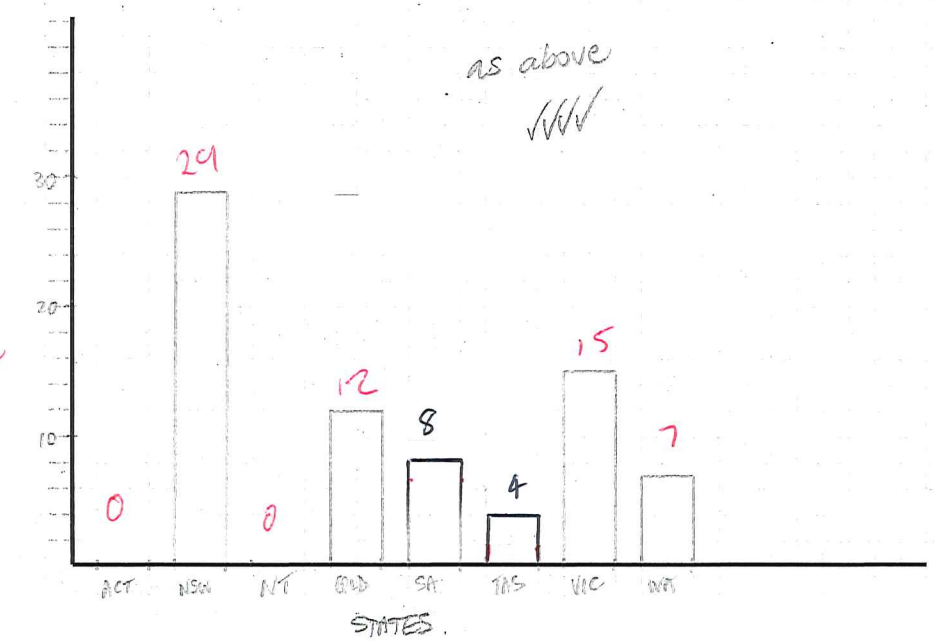
1

Question 4 (8 marks: 4, 4)

Construct a column graph, in the space below, for the total fatalities for **each state** of Australia in **2010**.



Construct a column graph, in the space below, for the total fatalities for **each state** of Australia in **2015**.



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

Compare the 2015 and 2010 graphs from question 4 and answer the questions below.

a) Which state(s) showed the greatest decrease in fatalities and by how much?

SA by 3

b) Which state(s) showed the greatest increase in fatalities? QLD

c) What is the range of fatalities in 2015? 29 24-0

PART B: Comparing Total Fatalities between Western Australia and South Australia

Question 6 (4 marks: 2, 2)

Complete the tables below for Western Australia and South Australia fatalities for 2015.

WA Fatalities

Type	Frequency
Driver	4
Motorcycle Rider	2
Pedestrian	1
Passenger	0
	7

SA Fatalities

Type	Frequency
Driver	4
Motorcycle Rider	1
Bicyclist	1
Passenger	2
	8

−1 per error

Question 7 (4 marks: 1, 1, 2)

The following questions relate to the two tables in question 6.

a) State one similarity between the two states.

Both had 4 drivers killed / M/C deaths differ by 1

b) State one difference between the two states.

NO WA passengers

No pedestrians died in SA / No cyclists killed in WA

c) Motorcyclists made up 25% of road deaths in Jan 2015.

a. True or False (circle)

WA + SA = 3

b. Justify your answer $\frac{3}{15} \times 100 = 20\%$.

PART C: Comparing Ages

Question 8 (6 marks: 3, 3)

Complete the tables below to collate the ages of all fatalities into groups for both 2015 and 2010.

NB: $0 \leq age < 10$ *means all ages equal to 0 and greater than 0 but less than 10 and not equal to 10.*

Ages 2010 Road Fatalities

Age	Tally	Frequency
$0 \leq age < 10$	III	3
$10 \leq age < 20$	𝍸 𝍸 I	16
$20 \leq age < 30$	𝍸 𝍸 III	14
$30 \leq age < 40$	𝍸 III	9
$40 \leq age < 50$	𝍸 III	8
$50 \leq age < 60$	𝍸 𝍸	10
$60 \leq age < 70$	𝍸 II	7
$70 \leq age < 80$	𝍸	5
$80 \leq age < 90$	III	3
$90 \leq age < 100$		
		75

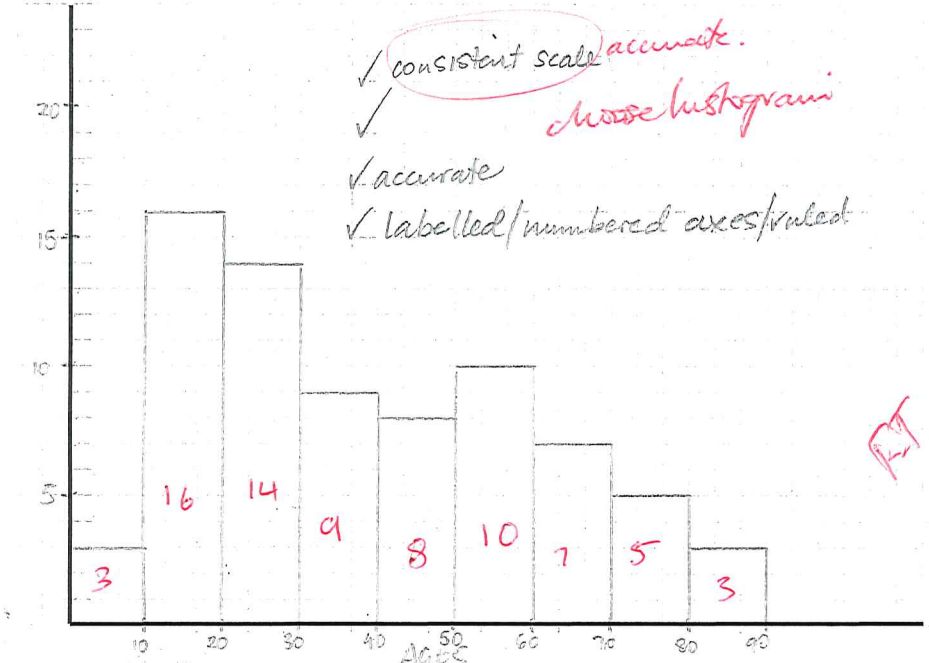
2015 Road Fatalities

Age	Tally	Frequency
$0 \leq age < 10$	II	2
$10 \leq age < 20$	𝍸	5
$20 \leq age < 30$	𝍸 𝍸 𝍸	15
$30 \leq age < 40$	𝍸 𝍸 𝍸	15
$40 \leq age < 50$	𝍸 IIII	9
$50 \leq age < 60$	𝍸 𝍸 II	12
$60 \leq age < 70$	IIII	4
$70 \leq age < 80$	𝍸 II	7
$80 \leq age < 90$	𝍸 I	6
$90 \leq age < 100$		
		75

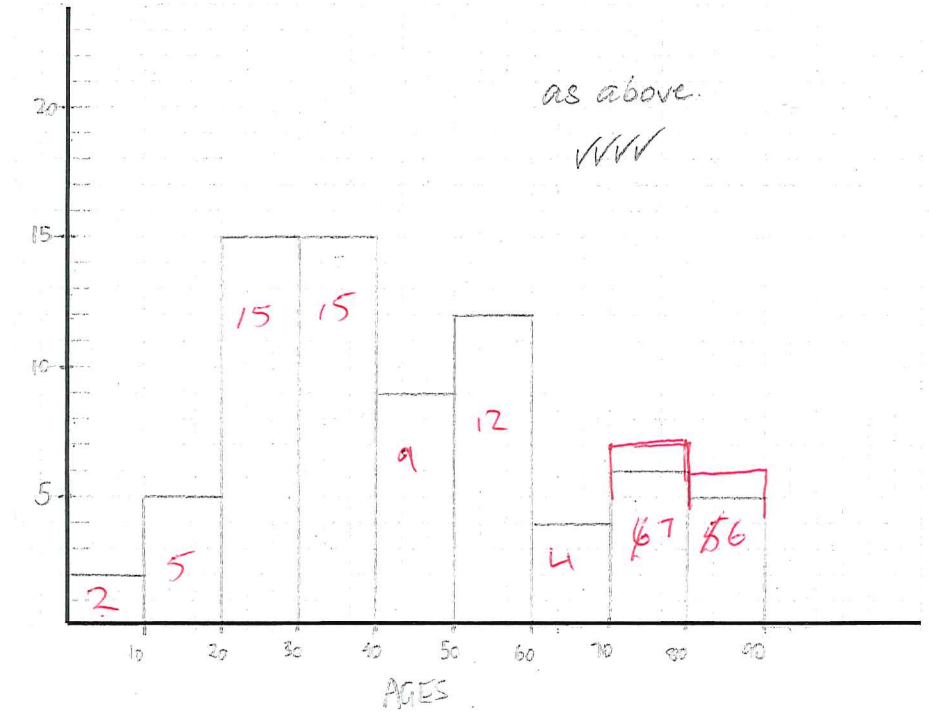
−1 per error

Question 9 (8 marks: 4, 4)

Construct a histogram to display the ages of road fatalities for **2010**.



Construct a histogram to display the ages of road fatalities for **2015**.



Question 10 (8 marks: 6, 1, 1)

Using the histograms in question 9, complete the table and answer the following questions.

	2010	2015
Modal Class	10 – 20 ✓	20 – 30, 30 – 40 ✓
Range	90 ✓	90 ✓
Median Class	30 – 40 ✓	40 – 50 ✓

Bimodal

a) State one similarity between the age of road fatalities for 2010 and the age of road fatalities for 2015.

Range is same. ✓ only 1 correct.

b) State one difference between the age of road fatalities for 2010 and the age of road fatalities for 2015.

Median class has increased ✓
2015 is bimodal (others)

PART D: Comparing the Ages of the Fatalities in Western Australia for 2010 and 2015

Question 11 (2 marks: 3, 3)

Write the ages of all fatalities in Western Australia in the year 2010. Calculate the mean age (1dp).

22, 55, 44, 52, 78, 71, 23 ✓

345 ÷ 7 = 49.3 yrs

✓ ✓

22, 23, 44, 52, 55, 71, 78

Write the ages of all fatalities in Western Australia in the year 2015. Calculate the mean age (1dp)

33, 56, 82, 38, 27, 51, 83 ✓

370 ÷ 7 = 52.9 yrs

✓ ✓

27, 33, 38, 51, 56, 82, 83

Question 12 (6 marks)

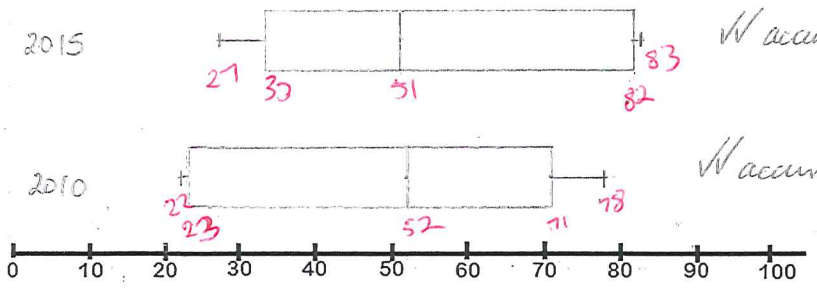
For each year, determine the five number summaries. ½ each

Five Number Summary	2010	2015
Minimum	22 ✓	27
Lower Quartile	23 ✓	33
Median	52 ✓	51
Upper Quartile	71 ✓	82
Maximum	78 ✓	83

Question 13 (5 marks)

Draw the box plots for each year on the grid below.

−1 per error ✓ (labelled 2015/2010)



✓✓ accurate

✓✓ accurate.

Question 14 (4 marks: 1, 1, 1, 1)

Using the data, answer True or False to the following statements.

a) The interquartile range for 2010 is 29. False ✓

b) The minimum aged fatality, for 2015, is 11. False ✓

c) The range for 2010 is 56. True ✓

d) More than 50% of fatalities in 2015 were older than 50. True ✓

PART E: General Questions

Question 15 (7 marks: 2, 1, 2, 1, 1)

Looking at all data collated, your statistics and the original data given, answer the following questions.

a) Which day of the week did most fatalities occur in:

i. 2010? Tuesday ✓✓

ii. 2015? Thursday ✓

b) Which state had the most fatalities for both years in January? NSW ✓

c) What percentage of fatalities in 2015 were male?

57/75 × 100 = 76% ✓ ✓

d) In 2010, what percentage of fatalities were aged less than 20?

19/75 × 100 = 25% (25.3%) ✓

e) Based on all the data you have analysed, identify the age, gender and state of a person who would be at most risk of being a road fatality in Australia.

Male, NSW, 20 − 30 yr age group ✓

✓ 20−29