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91584



NEW ZEALAND QUALIFICATIONS AUTHORITY
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SUPERVISOR'S USE ONLY

Level 3 Mathematics and Statistics (Statistics), 2015

91584 Evaluate statistically based reports

2.00 p.m. Thursday 19 November 2015

Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Evaluate statistically based reports.	Evaluate statistically based reports, with justification.	Evaluate statistically based reports, with statistical insight.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

Pull out Resource Booklet 91584R from the centre of this booklet.

Show ALL working.

Make sure that you have the Formulae and Tables Booklet L3–STATF.

If you need more room for any answer, use the space provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–11 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

TOTAL



ASSESSOR'S USE ONLY

QUESTION ONE

Refer to Report 1 in the resource booklet to answer the following questions.

- (a) Identify and describe the explanatory and response variables for the study.

- (b) (i) Explain whether this study is an observational study or an experiment.

- (ii) Give an implication of using the type of study identified in part (i) for the specific relationship investigated.

(c) For this study, the researchers collected sample data on the distribution of car colours for all cars on Auckland roads.

(i) Explain why the researchers compared the percentage of colours for cars involved in crashes to the percentage of colours of cars on Auckland roads.

(ii) The researchers used cluster sampling to obtain their sample.

Discuss ONE example of how clusters may have been determined to ensure a representative sample.

QUESTION TWO

Refer to Report 2 in the resource booklet to answer the following questions.

For parts (a) – (d), assume that the sample obtained is representative of all New Zealand drivers.

- (a) The report states that “59% of the survey respondents rated changing the radio/iPod/MP3 player while driving as distracting.”

Construct a confidence interval using this survey percentage and interpret this confidence interval.

- (b) The report states that 20% of survey respondents had sent texts while driving.

Discuss ONE potential issue with a survey question that asks respondents for this particular survey if they have sent texts while driving.

QUESTION THREE

Refer to Report 3 in the resource booklet to answer the following questions.

- (a) The report states that “The data have been adjusted (weighted) according to 2013 Census data.”

Explain why this was done.

- (b) Figure 1 uses vertical lines (error bars) to represent 95% confidence intervals.

- (i) Give ONE reason why the vertical lines for the “never smokers” and “ex-smokers” are shorter than those for “current smokers”.

- (ii) The 95% confidence interval for the percentage of current smokers in New Zealand that engaged in risky alcohol consumption in the last four weeks is approximately (44%, 62%).

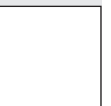
Use the margin of error associated with this confidence interval to estimate the number of people in the sample who were current smokers.

- (c) The report states that “After adjusting for confounding variables, current smokers and ex-smokers were more likely than never smokers to report engaging in risky alcohol consumption in the last four weeks.”

Identify ONE potential confounding variable that may have needed to be taken into account, and discuss how this variable may have been confounding.

- (d) A potential non-sampling error for surveys is to consider how people behave when surveyed.

Fully describe how the behaviour of people when surveyed could be a potential non-sampling error for this survey, and discuss how it could cause bias.



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