NZQA

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

Level 3 Mathematics and Statistics (Statistics), 2019

91584 Evaluate statistically based reports

9.30 a.m. Thursday 28 November 2019
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 2–12 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
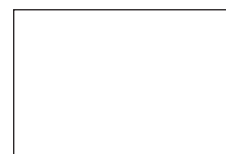
ASSESSOR'S USE ONLY

QUESTION ONE

*Refer to **Report 1** in the resource booklet to answer the following question parts.*

(a)   Identify and describe the explanatory and response variables in the study in Report 1.

Explanatory variable: _____

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_____

Response variable: _____

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(b)   The report states that in the "... three years after the development, they found there was a reduction of 1.6% in motor vehicle kilometres travelled, resulting in a 1% drop in carbon emissions".

Explain why the vehicle kilometres travelled were measured twice.

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(c)   (i)   Describe why the researchers used a variety of methods to collect information on car usage.

(ii) Identify a feature of this report where the results have been extended, and discuss why this may be a potential issue.

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(d) Given the type of study, explain why the researchers made the comparison with the two towns of Whanganui and Masterton.

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QUESTION TWO

*Refer to **Report 2** in the resource booklet to answer the following question parts.*

(a)   Report 2 states that 937 people took part in the council's survey.

Calculate the margin of error for this survey, and explain why a margin of error should be included in reports on statistical surveys.

(b)   Discuss the statistical reasoning for why, as part of their sampling method, the council used a mixture of online and paper copy forms for respondents to complete the survey.

As part of your answer, describe at least ONE issue that needs to be considered with the sampling method used in this survey.

(c) The report states that 35.1% of respondents said they 'regularly' use plastic bags whilst 47.9% of respondents said they 'only occasionally' use plastic bags in relation to their current habits while shopping.

Could a claim be made that a higher percentage of people in the Marlborough District Council area 'only occasionally' use plastic bags compared to the percentage of people in the Marlborough District Council area who 'regularly' use plastic bags for their shopping?

Construct ONE confidence interval, and interpret this interval as part of your answer.

(d) A large New Zealand waste management company conducted its own survey on 1007 shoppers' attitudes to plastic bags. Figure 1 in the report shows a summary of responses to a question asking about people's attitudes to a supermarket levy on plastic bags.

Identify one of the survey percentages shown in Figure 1, and explain why it would not be appropriate to use a margin of error based on this survey percentage to construct an approximate 95% confidence interval for the population proportion for the percentage of people who held this view on the issue of supermarkets charging a levy on plastic bags.
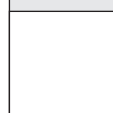
QUESTION THREE

*Refer to **Report 3** in the resource booklet to answer the following question parts.*

(a)   Report 3 mentions two groups of students, each 21 in size.

Describe what the control and treatment groups were for this experiment.

Control group: _____

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Treatment group: _____

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(b)   Explain how the allocation (split) of the school students into two groups should have been done, and why it would be important to allocate the students in this way.

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(c) Discuss ONE potential issue with the way in which this study was designed that could weaken the claim that the students "had shown a definite improvement in writing and general focus".

(d) Explain why there is a potential issue with the source of the funding for the study.

Question Three continues on the following page.

(e)   A potential issue with a statistical study is extending the results inappropriately.

Discuss TWO potential issues with extending the results of this study to all children in New Zealand schools.

QUESTION NUMBER

QUESTION NUMBER	

Extra paper if required.
Write the question number(s) if applicable.