



SUPERVISOR'S USE ONLY

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Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Level 3 Mathematics and Statistics (Statistics) 2023

91584 Evaluate statistically based reports

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.

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

Show ALL working.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–8 in the correct order and that none of these pages is blank.

Do not write in any cross-hatched area (DO NOT WRITE). This area will be cut off when the booklet is marked.

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

QUESTION ONE: DAYLIGHT SAVING

Refer to Resource One in the resource booklet to answer the following question parts.

- (a) Construct and interpret a confidence interval for the proportion of adult New Zealanders who are in favour of keeping the daylight saving system as it is.

- (b) In Figures 1(a) and 1(b), the reasons shown in the graphs add to more than 100%.

- (i) Explain, in relation to how the survey question would have been written, why the reasons on the two figures all add to more than 100%.

- (ii) In Figure 1(a), the two most common reasons given for keeping daylight saving as it is are described as the main reasons.

A student is comparing support for these main reasons by using a confidence interval for the difference in proportion between New Zealanders who give one reason for keeping the current daylight saving system as “more time to enjoy daylight hours during summer” and those who give one reason for keeping the current daylight saving system as “more time for home outdoor activities.”

Discuss why this approach may or may not be appropriate.

Support your answer with statistical reasoning.

**QUESTION TWO: A TOWEL LESS:
HOW PSYCHOLOGISTS HARNESS SOCIABILITY TO CUT WASTE**

Refer to Resource Two in the resource booklet to answer the following question parts.

- (a) The response variable for this study was the number of towels used per room per day.

Discuss ONE reason why this is a good choice for the response variable.

- (b) Random allocation minimises the impact of other variables on the outcome of a study. This study randomly allocated hotel guests to one of three conditions.

Discuss how random allocation minimises the impact on one variable other than the explanatory variable in this study, its likely impact on the response variable, and how random allocation lessens this issue.

- (c) This study used blinding, with both the hotel guests and the hotel room staff as a key element of the study design.

- (i) Describe the blinding used with hotel guests and with hotel staff in the context of this study.

(ii) Discuss why blinding was an important experimental design aspect in this study.

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

Discuss TWO potential issues with extending the results of this study to other hotels in other locations around the world.

Issue one: _____

Issue two: _____

- (c) Describe ONE advantage and ONE disadvantage of using interviews to collect data on respondents' media consumption.

Discuss how this advantage and this disadvantage could impact on the quality of the data discussed in this report.

Advantage: _____

Disadvantage: _____

- (d) In the analysis of the survey results, the sample was “post-weighted” to ensure it was representative of the 15+ New Zealand population. Factors of access to a landline, gender, age, and ethnicity were accounted for.

Discuss TWO factors and, for each, why it is important that they have been fairly represented in the data.

Factor one: _____

Factor two: _____

