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NZQA | Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Level 3 Mathematics and Statistics (Statistics) 2026

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 2–12 in the correct order and that none of these pages is blank.

Do not write in the margins (////). 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.

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QUESTION ONE: NATIONAL TEDDY BEAR DAY SURVEY

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

(a) The headline for this study states "more than half of adult Americans still have their teddy bear from childhood."

Based on the study report, identify the error in the headline, and explain why it is an error.

(b) Assume the sample is representative of all US adults (adult Americans).

(i) Construct and interpret a confidence interval for the proportion of all US adults who sleep with their stuffed animal by their side.

(ii) Could the following claim be made based on this report?

A higher proportion of US adults kept two or more favourite stuffed animals from their childhood than kept only one favourite stuffed animal.

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

(c) To gather data on childhood stuffed animals, US adults were asked the following question:

"What is the first memory that comes to mind when you think about a childhood stuffed toy? Select ONE item from the list below."

Identify ONE potential issue with the wording of this question that may affect the results of the study.

Explain why it is an issue, and describe its potential effect on the findings of this study.

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

Discuss TWO potential issues with extending the results of this study to trends in stuffed animal ownership for adult New Zealanders.

QUESTION TWO: DO DOGS JUDGE YOU?

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

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

Explanatory variable: _____

Response variable: _____

(b) Identify a potential confounding variable in this context, and explain what steps were taken to reduce its impact on the results.

(c) As part of the study design, the researchers randomly varied the order of the demonstrations ("competent" actor first or "incompetent" actor first).

Explain why this was an important aspect of the study design.

(d) Figure 2 includes a dashed line, described as the "chance level".

Explain what this means in this context, and how it is related to the conclusions drawn from the study.

(e) *Oh my dog* blog reported on this article. Here is an excerpt:

"So, the gist of the experiment is that randomly selected pet dogs watched two people manipulate a box. One person, the "competent" person, opened it easily. The other person, the 'incompetent' person, did not."

Source: https://ohmydogblog.com/2024/07/your-dog-judges-you/

Identify the error made by the blogger, and the implications on the conclusions drawn from the study.

QUESTION THREE: SECOND-HAND FASHION

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

(a) (i) Calculate the margin of error for the *Designer Wardrobe* study.

(ii) Explain the impact on the margin of error of the larger sample size in the *ThredUp* study compared to the *Designer Wardrobe* study, and any inferences made.

No calculations are required to answer this question.

(b) Identify one of the survey percentages shown, and explain why it would not be appropriate to use the reported margin of error to construct an approximate 95% confidence interval for the population proportion using this.

(c) Assume the samples from each report are representative of the populations.

Could the following claim be made based on these studies?

A higher proportion of New Zealand shoppers bought second-hand than US shoppers.

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

(d) The *Designer Wardrobe* report was based on a self-selected sample that was collected from visitors to their website and their social media platforms.

The *ThredUp* report was based on a representative sample of US consumers, with *GlobalData* using research participants that matched the characteristics of the target population.

Describe the main difference of the method of selection of the two samples, and the implications of this on the results from their surveys.

(e) *Pollfish* is a paid platform that allows businesses to design and conduct their own surveys. This means that *Designer Wardrobe* wrote the survey questions, conducted the survey, and generated the report themselves.

Discuss TWO concerns you have with *Designer Wardrobe*'s involvement in this survey that may impact the results of the report.

For each concern, include an example to justify why it is a concern.

Concern one:

Concern two:

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QUESTION NUMBER

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