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Draw a cross through the box (☒) if you have NOT written in this booklet

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Mana Tohu Mātauranga o Aotearoa

New Zealand Qualifications Authority

Level 3 Mathematics and Statistics

(Statistics) 2025

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.

**QUESTION ONE: SURVEY REVEALS GENERATIONAL DIVIDE
IN POLITENESS TOWARDS AI**

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

- (a) (i) The article states that the margin of error for the survey is 2.2%.

Show how this margin of error was calculated.

- (ii) Explain why the margin of error should be included in statistical survey reports.

- (b) Assume the sample of Americans is representative of all Americans.

Construct and interpret a confidence interval for the proportion of Americans who are polite when communicating with AI.

- (c) A similar survey of 1250 New Zealanders was conducted, and reported that 624 New Zealanders are polite when communicating with AI.

Can the following claim be made from the results of these surveys?

New Zealanders are more polite when communicating with AI than Americans.

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

- (d) The survey method describes four situations where survey responses were excluded if they fail quality-checking measures.

For ONE situation, explain **why** survey responses may have been excluded, and **how** the survey results may have been impacted if these responses were **not** excluded.

QUESTION TWO: PEOPLE PREFER ART WHEN THEY BELIEVE IT WAS CREATED BY A HUMAN RATHER THAN AI

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

- (a) (i) Explain why this study is an experimental study, and not an observational study.

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

Explanatory variable: _____

Response variable(s): _____

- (b) (i) Explain why, for each participant, the labels “Human-created” and “AI-created” were randomly assigned to each painting.

- (ii) Explain why the paintings were shown to the participants in a random order.

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

Discuss why this issue may be a problem with regards to the claim “*people are biased against AI-created art*”.

QUESTION THREE: *THE PLANTED POT SURVEY*

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

- (a) *The Planted Pot* survey summary does not include any information about how respondents were selected, but, to be able to correctly interpret the results, it is important to know the sampling method that was used.

What information would readers need to be given in order to be able to determine if the results are representative of the population?

- (b) *The Planted Pot* is a New Zealand-based company, selling handmade plant pots from an online store.

The target population for this survey was all house plant owners living in New Zealand, Canada, the USA, the United Kingdom, and Australia. The sampling frame for this survey was subscribers to *The Planted Pot* monthly newsletter, and visitors to their social media platforms.

Describe ONE situation where the target population and the sampling frame for this survey may not match.

- (c) Identify ONE of the survey percentages in *The Planted Pot* survey summary 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 survey percentage.

- Could the following claim be made based on this survey?
- A higher proportion of house plant owners in New Zealand, Canada, the USA, the United Kingdom, and Australia spend less than one hour per week taking care of their house plants than spend between one and three hours.*
- Construct ONE confidence interval and interpret this interval as part of your answer.

Question Three continues
on the following page.

- Discuss why the results of this survey do not give a good indication of how fast the number of house plants in a home is growing, and how this may have impacted the estimate of the number of house plants in a home.

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