

SUPERVISOR'S USE ONLY

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Tirohia te uhi o muri e kitea ai te
whakapākehātanga o tēnei uhi

91584M



Tuhia he (X) ki te pouaka mēnā
kāore koe i tuhi kōrero ki tēnei puka

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Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Te Pāngarau me te Tauanga (Te Tauanga), Kaupae 3, 2025

91584M Te arotake pūrongo ā-tauanga

Ngā whiwhinga: E whā

Paetae	Kaiaka	Kairangi
Te arotake pūrongo ā-tauanga.	Te arotake pūrongo ā-tauanga e whai parahautanga ana.	Te arotake pūrongo ā-tauanga e whai māramatanga ā-tauanga ana.

Tirohia kia kitea ai e rite ana te Tau Ākonga ā-Motu (NSN) kei runga i tō puka whakauru ki te tau kei runga i tēnei whārangi.

Me whakamātau koe i ngā tūmahi KATOA kei roto i tēnei pukapuka.

Tangohia te pukapuka rauemi 91584MR kei te puku o tēnei pukapuka.

Tirohia kia kitea ai kei a koe Te Puka mō ngā Ture Tātai me ngā Tūtohi L3–STATMF.

Whakaaturia ngā whiriwhiringa KATOA.

Ki te hiahia wāhi atu anō koe mō ō tuhinga, whakamahia ngā whārangi wātea kei muri o tēnei pukapuka.

Tirohia kia kitea ai e tika ana te raupapatanga o ngā whārangi 2–19 o tēnei pukapuka, ka mutu, kāore tētahi o aua whārangi i te takoto kau.

Kaua e tuhi ki ngā paenga (X/X/X). Ka poroa taua wāhanga ka mākahia ana te pukapuka.

HOATU TE PUKAPUKA NEI KI TE KAIWHAKAHAERE HEI TE MUTUNGA O TE WHAKAMĀTAUTAU.

**TE TŪMAHI TUATAHI: E KITEA ANA I TĒTAHI RANGAHAU TE WEHENGĀ Ā-REANGA
O TE MĀHAKI KI TE ATAMAI HANGAHANGA (AI)**

Tirohia te Rauemi Tuatahi kei te pukapuka rauemi hei whakaoti i ngā wāhanga o te tūmahi e whai nei.

- (a) (i) E mea ana te atikara ko te 2.2% te pae hapa o te rangahau.

Whakaaturia te ara i tātaia ai tēnei pae hapa.

- (ii) Whakamāramahia mai te take me mātua whai wāhi te pae hapa ki ngā pūrongo
mō ngā rangahau ā-tauanga.

- (b) Me kī, e whakaahua ana te tīpakonga o ngā tāngata o Amerika i ngā tāngata katoa o Amerika.

Waihangatia, ka whakamāoritia ai tētahi horahanga whakapono mō te ōwehenga o ngā tāngata o
Amerika e māhaki ana i a rātou e whakawhiti kōrero ana ki te AI.

**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) I whakahaerehia tētahi rangahau e āhua ōrite ana, ki ngā tāngata 1250 o Aotearoa, ā, ka puta te pūrongo e 624 ngā tāngata o Aotearoa e māhaki ana i a rātou e whakawhiti kōrero ana ki te AI.

E tika ana rānei te whakapuakanga o te whakapae e whai ake nei i ngā hua o aua rangahau?

He nui ake te māhaki o ngā tāngata o Aotearoa i ngā tāngata o Amerika i a rātou e whakawhiti kōrero ana ki te AI.

Waihangatia TĒTAHI horahanga whakapono, ka whakamāori ai i taua horahanga hei wāhanga mō tō whakautu.

- (d) Ka whakaahuatia e te tukanga rangahau ngā horopaki e whā i aukatia ai ngā urupare rangahau mēnā kāore i eke ki ngā paearu whakaū kounga.

Mō TĒTAHI horopaki, whakamāramahia mai te **take** i aukatia ai pea ētahi urupare rangahau, me te **āhua** pea o te pāngia o ngā hua o te rangahau mēnā **kāore** aua urupare i aukatia.

- (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.

Tirohia te Rauemi Tuarua kei te pukapuka rauemi hei whakaoti i ngā wāhanga o te tūmahi e whai nei.

- Te/ngā taurangi urupare: _____

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*”.

TE TŪMAHI TUATORU: TE RANGAHAU O 'THE PLANTED POT'

Tirohia te Rauemi Tuatoru kei te pukapuka rauemi hei whakaoti i ngā wāhanga o te tūmahi e whai nei.

- (a) Kāore he taipitopito i te whakarāpopototanga o te rangahau o *The Planted Pot* mō te ara i kōwhiria ai ngā kaiwhakautu pātai, engari, e tika ai te whakamāoritia o ngā hua, he mea nui te mōhio ki te tukanga tīpako i whakamahia ai.

He aha ngā taipitopito me mātua tuku ki ngā kaipānui e ū ai tō rātou mōhio ki te whakaatatanga o te taupori i roto i ngā hua?

- (b) He umanga a *The Planted Pot* kei Aotearoa e hoko atu ana i ngā ipu hanga ā-ringā i tētahi toa tuihono.

Ko te taupori i arotia ai i tēnei rangahau, ko ngā tāngata whai tipu ā-whare e noho ana i Aotearoa, i Kānata, i Amerika, i Peretānia, me Ahitereiria. Ko te anga tīpakonga mō tēnei rangahau, ko te hunga kua tūhono ki te pānui ā-marama o *The Planted Pot*, me te hunga ka toro ki ā rātou pae pāhopori.

Whakaahuatia TĒTAHI horopaki e kore ai pea e hāngai te taupori e arotia ana me te anga tīpakonga mō tēnei rangahau.

- (c) Tautohua TĒTAHI o ngā ōrau rangahau i te whakarāpopototanga o te rangahau o *The Planted Pot*, ka whakamārama ai i te take kāore e tika ana kia whakamahia te pae hapa i pūrongotia ai hei waihanga i tētahi horahanga whakapono e āhua 95% ana mō te ōwehenga o te taupori e whakamahi ana i taua ōrau rangahau.

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.

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

Mathematics and Statistics (Statistics) 91584M, 2025

- Matapakitia te take kāore ngā hua o te rangahau nei e āta tohu ana i te tere piki o te maha o ngā tipu ā-whare i tētahi kāinga, me te āhua pea o te pānga o tērā ki te whakatau tata o te maha o ngā tipu ā-whare i tētahi kāinga.

- 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.

**He whārangi anō ki te hiahiatia.
Tuhia te tau tūmahi mēnā e hāngai ana.**

TE TAU
TŪMAHI

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

QUESTION
NUMBER

**He whārangi anō ki te hiahiatia.
Tuhia te tau tūmahi mēnā e hāngai ana.**

TE TAU
TŪMAHI

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

QUESTION
NUMBER

English translation of the wording on the front cover

Level 3 Mathematics and Statistics (Statistics) 2025

91584M 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 91584MR 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 2–19 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.