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91584M



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NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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

SUPERVISOR'S USE ONLY

Te Pāngarau me te Tauanga (Tauanga), Kaupae 3, 2019

91584M Te aromātai i ngā pūrongo tauanga

9.30 i te ata Rāpare 28 Whiringa-ā-rangi 2019
Whiwhinga: Whā

Paetae	Kaiaka	Kairangi
Te aromātai i ngā pūrongo tauanga.	Te aromātai i ngā pūrongo tauanga, me ngā parahautanga.	Te aromātai i ngā pūrongo tauanga, me te āhuetanga mātau tauanga.

Tirohia mēnā 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 i waenga o tēnei pukapuka.

Tuhia ō mahinga KATOA.

Tirohia mēnā kei a koe te Pukapuka Tikanga Tātai me ngā Tūtohi L3–STATMF.

Mēnā ka hiahia whārangi atu anō koe mō ō tuhinga, whakamahia ngā whārangi wātea kei muri o tēnei pukapuka, ka āta tohu ai i te tau tūmahi.

Tirohia mēnā e tika ana te raupapatanga o ngā whārangi 2–21 kei roto i tēnei pukapuka, ka mutu, kāore tētahi o aua whārangi i te takoto kau.

ME HOATU RAWA KOE I TĒNEI PUKAPUKA KI TE KAIWHAKAHAERE Ā TE MUTUNGA O TE WHAKAMĀTAUTAU.

TAPEKE

MĀ TE KAIMĀKA ANAKE

TŪMAHI TUATAHI

Tirohia te **Pūrongo 1** kei te pukapuka rauemi hei whakatutuki i ngā wāhanga tūmahi e whai ake nei.

- (a) Tautohu me te whakaahua i ngā taurangi whakamārama me ngā taurangi urupare i roto i te rangahau kei te Pūrongo 1.

Taurangi whakamārama: _____

Taurangi urupare: _____

- (b) E kī ana te pūrongo “... e toru tau mai i te whakawhanaketanga, i kitea e 1.6% te hekenga o ngā kiromita i haerehia e ngā waka, ā, ko te otinga o tēnei he 1% te hekenga o ngā tukunga waro”.

Whakamāramahia mai te take e rua ngā inenga o ngā kiromita i haerehia e ngā waka.

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: _____

Response variable: _____

- (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.

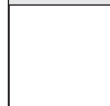
(c) (i) Whakaahuahia mai he aha i whakamahia ai e ngā kairangahau ngā tini tūmomo tikanga hei kohikohi i ngā mōhiohio mō te whakamahinga waka.

- (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.

ASSESSOR'S USE ONLY

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



TŪMAHI TUARUA

Tirohia te Pūrongo 2 kei te pukapuka rauemi hei whakatutuki i ngā wāhanga tūmahi e whai ake nei.

(a) E kī ana te Pūrongo 2, e 937 ngā tāngata i whakauru ki te tirohanga tauanga a te kaunihera.

Tātaihia te pae hapa mō tēnei tirohanga tauanga, ā, ka whakamārama mai he aha te take me whakauru he pae hapa ki ngā pūrongo mō ngā tirohanga tauanga.

(b) Matapakitia te whakaaro whitake o te tauanga, i roto i te tikanga tīpakonga, i whakamahia e te kaunihera ētahi puka tuihono, ā-pepa hoki kia pai ai te whakaoti a ngā kaiwhakautu i te tirohanga tauanga.

I roto i tō tuhinga, me whakaahua kia KOTAHI te raruraru i te iti rawa me whakaaroaro mō te tikanga tīpakonga i whakamahia i roto i tēnei tirohanga tauanga.

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) E kī ana te pūrongo, 35.1% o ngā kaiwhakautu i kī he ‘rite tonu’ tā rātou whakamahi pēke kirihou, ā, 47.9% o ngā kaiwhakautu i kī ka whakamahia ngā pēke kirihou i ‘ētahi wā anake’ e pā ana ki ā rātou mahi ina hokohoko ana.

Ka taea anō te whakapae he nui ake te ōrau o ngā tāngata o te rohe o Te Kaunihera ā-Takiwā o Wairau he whakamahi i ngā pēke kirihou i ‘ētahi wā anake’ tēnā i te ōrau o te hunga i te rohe o Te Kaunihera ā-Takiwā o Wairau he ‘rite tonu’ te whakamahi i ngā pēke kirihou mō ā rātou hokohoko?

Waihangahia mai he āputa māia KOTAHI, ka whakamārama i tēnei āputa hei wāhanga o tō tuhinga.

- (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) I whakahaerehia e tētahi kamupene para nui o Aotearoa tāna ake tirohanga tauanga i ngā waiaro o ngā kaihekohoko 1007 ki ngā pēke kirihou. E whakaatu ana te Hoahoa 1 o te pūrongo i tētahi whakarāpopototanga o ngā whakautu ki tētahi pātai mō ngā waiaro o ngā tāngata ki tētahi utu hokomaha mō ngā pēke kirihou.

Tautohua tētahi o ngā ōrau o te tirohanga tauanga kei te Hoahoa 1, ka whakamārama he aha i kore ai e tika kia whakamahia te pae hapa e ai ki tēnei ōrau tirohanga tauanga hei waihanga i tētahi āputa māia 95% āwhiwhi mō te ōwehenga taupori mō te ōrau o te hunga e ū ana ki tēnei whakaaro mō te take o te whakahau utu a ngā hokomaha mō ngā pēke kirihou.

- (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.

TŪMAHI TUATORU

Tirohia te **Pūrongo 3** kei te pukapuka rauemi hei whakatutuki i ngā wāhanga tūmahi e whai ake nei.

- (a) E rua ngā rōpū ākonga kei te Pūrongo 3, he 21 te rahi o ia rōpū.

Whakaahuahia ngā rōpū whakatina me te whakamaimoa mō tēnei whakamātau.

Rōpū whakatina: _____

Rōpū whakamaimoa: _____

- (b) Whakamāramahia mai me pēhea kē te whakawehe i ngā ākonga kura ki ngā rōpū e rua, ā, he aha e hira ana kia pēnei kē te whakawehe i ngā ākonga.

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: _____

Treatment group: _____

- (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.

- (c) Matapakitia tētahi raruraru KOTAHI ka pā mai pea nā te āhua o te hanga i tēnei rangahau e mehameha ai te whakapae mō te kite i “te tino pai haere ake o te tuhituhi me te whakaaro tapatahi” o ngā ākonga.

- (d) Whakamāramahia mai te take he raruraru ka puta pea e pā ana ki te kaiutu i te rangahau.

**Ka haere tonu te Tūmahi
Tuatoru ki te whārangi 18.**

- (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 page 19.**

- (e) Ko tētahi raruraru ka puta pea i tētahi tirohanga tauanga ko te hē o te whakawhānui i ngā otinga.

Matapakitia kia RUA ngā raruraru ka taea nā te whakawhānui i ngā otinga o tēnei rangahau ki ngā tamariki katoa kei ngā kura i Aotearoa.

- (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.

English translation of the wording on the front cover

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.

91584M

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–STATMF.

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 2–21 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.