

See back cover for an English translation of this cover

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91584M



915845



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

Tohua tēnei pouaka mēnā  
KĀORE koe i tuhi kōrero ki  
tēnei pukapuka

## Te Pāngarau me te Tauanga (Tauanga), Kaupae 3, 2022

91584M Te arotake i ngā pūrongo nā runga i te tauanga

Ngā whiwhinga: E whā

Paetae	Kaiaka	Kairangi
Te arotake i ngā pūrongo nā runga i te tauanga.	Te arotake i ngā pūrongo nā runga i te tauanga, me te whai parahautanga.	Te arotake i ngā pūrongo nā runga i te tauanga, me te whai māramatanga tauanga.

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 KATOĀ kei roto i tēnei pukapuka.**

Tangohia te Pukapuka Rauemi 91584MR mai i te puku o tēnei pukapuka.

Tuhia ō whiriwhiringa KATOĀ.

Tirohia kia kitea ai kei a koe te pukapuka Tikanga Tātai me ngā Tūtohi L3–STATMF.

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 kei roto i tēnei pukapuka, ka mutu, kāore tētahi o aua whārangi i te takoto kau.

Kaua e tuhi i ngā wāhanga e kitea ai te kauruku whakahāngai (✗). Ka poroa pea taua wāhanga ka mākahia ana te pukapuka.

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

## TE TŪMAHI TUATAHI: BBC Good Food Nation – e tirohia ana e te patapatai ngā āhuatanga o tā te tamaiti kai

*Tirohia te Pūrongo 1 kei te pukapuka rauemi hei whakaoti i ngā wāhanga o te tūmahi nei.*

(a) E mea ana te pūrongo, ko te 3.2% te pae hapa.

(i) Whakaaturia te ara i tātaihia ai tēnei pae hapa.

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(ii) Whakamāramatia te take me mātua whai te pae hapa hei whakamāori i ngā whakataunga kua hua mai i tēnei patapatai.

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(b) Tautohua tētahi o ngā ōrau patapatai i te pūrongo, whakamāramatia hoki te take e kore nei e tika kia whakamahia te pae hapa i pūrongotia ai hei waihanga i te whakaawhiwhitanga o te 95% o te horahanga whakapono mō te ōwehenga o te taupori mā te whakamahi i tēnei ōrau patapatai.

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(c) E kīia nei, *kei kō atu i te haurua o ngā tamariki nō Peretānia e tapahi huawhenua ana.*

(i) Matapakina ētahi atu pārongo me mātua whai e pono ai te whakapae ko ngā tamariki i uia ai i te pūrongo nei e whakakanohi ana i ngā tamariki katoa o Peretānia i te wā o te patapatai.

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## QUESTION ONE: BBC Good Food Nation – survey looks at children’s eating habits

Refer to Report 1 in the resource booklet to answer the following question parts.

(a) The report states that the margin of error is 3.2%.

(i) Show how this margin of error was calculated.

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(ii) Explain why the margin of error is needed to interpret any inferential claims made from this survey.

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(b) Identify one of the survey percentages in the report, 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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(c) A claim is made that *over half of UK children chop vegetables*.

(i) Discuss what further information is required for the assumption to be valid that the children surveyed in this report are a representative sample of all UK children at the time of the survey.

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## TE TŪMAHI TUARUA: Ngā atakata hei whakapikinga wairua

*Tirohia te Pūrongo 2 kei te pukapuka rauemi hei whakaoti i ngā wāhanga o te tūmahi nei.*

- (a) Tautohua te taurangi whakamārama me te taurangi urupare mō tēnei rangahau.

Te taurangi whakamārama: \_\_\_\_\_

\_\_\_\_\_

Te taurangi urupare: \_\_\_\_\_

\_\_\_\_\_

- (b) I wāwāhia e ngā kairangahau ngā kaiuru e 748 puta noa i ngā rōpū akiaki.

- (i) Whakamāramatia te āhua e tika ai te wehenga (te wāwāhinga) o ngā rōpū akiaki.

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- (ii) Matapakina, ka mutu, me hāngai ngā kōrero ki taua whakamātautau, te take e whakahirahira nei kia pēnei te wehenga o ngā kaiuru.

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**QUESTION TWO: Memes as mood boosters**

*Refer to Report 2 in the resource booklet to answer the following question parts.*

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

Explanatory variable: \_\_\_\_\_

\_\_\_\_\_

Response variable: \_\_\_\_\_

\_\_\_\_\_

- (b) The researchers split the 748 participants across the treatment groups.

- (i) Explain how the allocation (split) of participants into the treatment groups should have been done.

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- (ii) Discuss, with specific reference to this experiment, why it is important to allocate the participants in this way.

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- (c) Whakaahuatia ai e ngā kairangahau te waihanganga o “tētahi inenga horopū” mai i ngā āwhata inenga maha mō tēnā, mō tēnā o ngā momo urupare e whā (te pīwari, te whakangio, te whakaamaimai me ngā kare ā-roto matareka).

He aha i whakahirahira ai te tono i ngā kaiuru kia whakataumata i ia momo urupare ki ngā atakata i ngā wā maha mā te whakamahi i ngā āwhata e āhua ōrite ana?

Whakamahia ngā taunaki whāiti i roto i te pūrongo hei tautoko i tō urupare.

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- (d) Ko tētahi raru tērā pea ka puta i ngā rangahau tauanga, ko te hē o te whakawhānui i ngā putanga.

Matapakina ngā raru E RUA ka puta pea i te whakawhānuitanga o ngā putanga o tēnei rangahau ki ngā tāngata katoa o Aotearoa.

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- (c) The researchers describe creating “a single reliable measure” from the multiple item ratings for each of the four types of response (cuteness, humour, anxiety, and positive emotions).

Why was asking participants to rate each type of response to the memes multiple times using similar scales important?

Use specific evidence from the report to support your response.

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- (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 all people in New Zealand.

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## TE TŪMAHI TUATORU: Ngā Kararehe Haumi i Aotearoa i te Tau 2020

*Tirohia te Pūrongo 3 kei te pukapuka rauemi hei whakaoti i ngā wāhanga o te tūmahi nei.*

- (a) Tautapahia tētahi tapanga atu anō e tika ana mō te Pūrongo mō ngā Kararehe Haumi i Aotearoa i te Tau 2020.

Tautohua, whakaahuatia hoki ngā taunaki nō roto i te pūrongo hei tautoko i tō tapanga.

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- (b) E kī ana te pūrongo

*Kei tua ake o te haurua o ngā kāinga i Aotearoa kāore nei he kararehe haumi, engari e pīrangī ana ki te kararehe haumi.*

Arotakehia tēnei kōrero mā te tātau me te whakamāori i tētahi horahanga whakapono, mā te whakamahi i ngā pārongo whaitake o te pūrongo.

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**QUESTION THREE: Companion Animals in New Zealand in 2020**

*Refer to Report 3 in the resource booklet to answer the following question parts.*

- (a) Suggest a suitable alternative headline for the Companion Animals in New Zealand 2020 Report. Identify and describe the evidence in the report to support your headline.

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- (b) The report states that

*More than half of the households in New Zealand that don't currently have a companion animal would like to have one.*

Evaluate this claim by calculating and interpreting a confidence interval using relevant information provided in the report.

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- I whakahaere a Camorra Research i ngā rangahau ā-ipurangi i waenga i tētahi tīpakohanga e whakakanohi ana i te motu mai i ētahi pakeke kua 18 ngā tau, kua pakeke ake rānei. I āta kōwhiria ngā kaiuru mā te whakamahi i ngā Tatauranga ā-Motu 2018 a Tatauranga Aotearoa e mōhiotia ai e whakakanohi ana te tīpakohanga i te taupori o ngā kāinga o Aotearoa i runga i te pakeke, i te ira, i te rohe anō hoki. Ko te tapeke o te tīpakohanga, ko te 3599 kaiurupare, tae atu ki ngā tāngata e 2322 e whai mōkai ana. I rangahaua ngā tāngata e 43 atu anō e whai hōiho ana kia eke ai te tapeke o ngā tāngata e whai hōiho ana ki te 100.*

- (c)

*Camorra Research conducted online research among a nationally representative sample of adults aged 18 years and older. Quotas were employed using Statistics NZ 2018 Census data to ensure the sample was representative of the NZ household population by age, gender, and region. The total representative sample was 3599 respondents, which included 2322 pet owners. An additional boost of 43 horse owners was conducted to bring the total number of horse owners surveyed to 100.*

Explain what is meant by the term “nationally representative sample” in this context.

- (d) The report states that the proportion of New Zealand households having a pet is second only to the US.

Could a claim be made that the proportion of US households that have a pet is higher than the proportion of New Zealand households that have a pet?

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

**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) 2022

### 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.

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.

**You should attempt ALL the questions in this booklet.**


Pull out Resource Booklet 91584MR 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 extra space provided at the back of this booklet.

Check that this booklet has pages 2–15 in the correct order and that none of these pages is blank.

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

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

91584M