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NZQA

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SUPERVISOR'S USE ONLY

Tick this box if you have NOT written in this booklet

Level 3 Mathematics and Statistics (Statistics) 2021

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.

Show ALL working.

Make sure that you have the Formulae and Tables Booklet L3–STATF.

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 – 8 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.

QUESTION ONE

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

(a) There were 883 respondents to the Federated Farmers Rural Connectivity Survey 2020.

(i) Calculate the margin of error for this survey.

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

(b) The report notes that several Federated Farmers members "couldn't complete the online questions because they didn't have internet access or connectivity was too patchy or slow."

Discuss what impact this might have on any inferences made from the results of the survey.

(c) Explain whether the sampling process used to obtain the sample of farmers for this survey is likely to have produced a representative sample for the target population (all New Zealand farmers).

Support your answer with statistical reasoning.

(d) Assume that the sample from the Federated Farmers Rural Connectivity Survey 2020 is representative of all New Zealand farmers. The report states that around 70% of the survey respondents indicated that their average download speed is between 0 – 20 Mbps.

Construct and interpret a confidence interval for the proportion of New Zealand farmers who have download speeds between 0 – 20 Mbps.

QUESTION TWO

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

(a) The experiment used two control groups – one group where the participants took the test in a room on their own (control condition), and one group where the participants took the test alongside a robot that provided them only with the instructions and was silent the rest of the time (robot control condition).

Explain why two control groups were used.

(b) Identify the explanatory and response variables for this experiment.

Explanatory variable:

Response variable:

(c) Discuss how the researchers might have established that the treatment group took more risks – that is, they inflated their balloons significantly more frequently than the robot control group.

(d) The study involved 180 undergraduate psychology students, split randomly across the three groups. The 154 females were split with 51, 52, and 51 in each group and the 26 males split with 9, 8, and 9 in each group.

Discuss why the researchers split the groups this way.

QUESTION THREE

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

(a) The headline for this report is: "Te reo Māori use by under-fives widespread".

Identify the evidence that has been presented in the report to support this headline.

(b) The study found that screen time was a negative predictor of te reo Māori.

Explain what is meant by a negative predictor in this context.

(c) Face-to-face interviews were used for this study.

Describe ONE advantage and ONE disadvantage of using face-to-face interviews in relation to collecting data on te reo Māori use by children.

Discuss how these advantages and disadvantages could impact on the results of the survey.

(d) Assume the 'Growing Up in New Zealand' longitudinal study is representative of all children in New Zealand born in 2009 and 2010.

Could the following claim be made based on this survey?

A lower proportion of New Zealand children born in 2009 and 2010 ***sometimes*** *or* ***often*** *speak simple words in te reo Māori than* ***rarely*** *or* ***never****.*

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

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

QUESTION NUMBER