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91584



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Level 3 Mathematics and Statistics (Statistics) 2022

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: 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.

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

(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.

(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.

- (ii) Identify ONE further variable that could be measured in this study that may have an effect on whether or not UK children can chop vegetables.

Discuss how this variable may have an effect and its possible impact on the above claim that over half of UK children chop vegetables.

Seven horizontal lines for writing the answer to part (ii).

- (d) Assume that the children and parents surveyed in this report are a representative sample of all UK children and parents at the time of the survey.

Could the following claim be made based on this survey?

A higher proportion of UK parents agreed or strongly agreed that their children were more interested in cooking at home during lockdown than disagreed with this statement.

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

Multiple horizontal lines for writing the answer to part (d).

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.

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

- (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.

- (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.

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.

- (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.

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

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