





NEW ZEALAND QUALIFICATIONS AUTHORITY MANA TOHU MĀTAURANGA O AOTEAROA

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

Level 3 Mathematics and Statistics (Statistics), 2018

91584 Evaluate statistically based reports

9.30 a.m. Thursday 22 November 2018 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 space provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–12 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.

TOTAL	

© New Zealand Qualifications Authority, 2018. All rights reserved.

No part of this publication may be reproduced by any means without the prior permission of the New Zealand Qualifications Authority.

QUESTION ONE

Refer to Report 1 in the resource booklet to answer the following questions.

The graph in Report 1 refers to a control group and a treatment group.

(a) Describe what the control and treatment groups were for this experiment.

(b) The report states that the researchers "split 1095 daily Facebook users into two groups".

Explain how the allocation (split) of daily Facebook users into two groups should have been done, and why it would be important to allocate the daily Facebook users this way.

(c) Discuss how the researchers might have established that the treatment group reported a "significantly higher level of life satisfaction".



(d) Discuss ONE potential issue with the design of the study that could weaken the claim that there are "positive effects of a social media holiday".

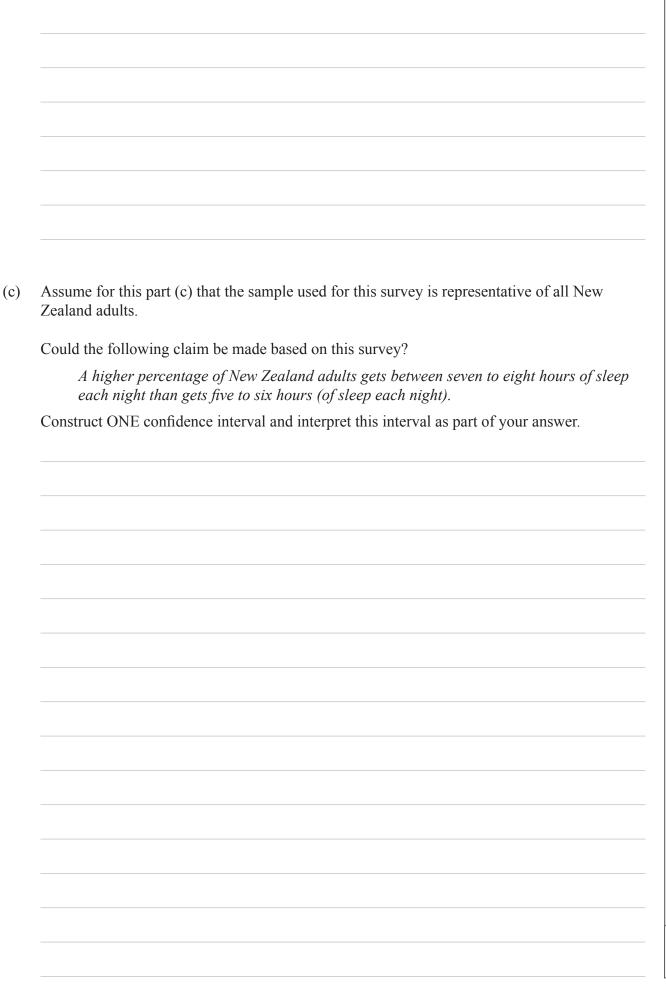
QUESTION TWO

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

(a) (i) Show how the reported margin of error for this survey was calculated.

 (ii) Identify one of the survey percentages shown in the infographic, 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.

(b) Discuss ONE potential issue with making a claim, based on this survey, that most New Zealand adults look for quality when buying beauty products.



QUESTION THREE

Refer to **Report 3A** and **Report 3B** in the resource booklet to answer the following questions.

The GCSE (General Certificate of Secondary Education) is a qualification undertaken by students in England, Wales, and Northern Ireland. GCSE examinations for individual subjects are generally taken by students at the end of Year 11, with the results for each examination reported using points out of 100, and also as a grade.

(a) Identify and describe the explanatory and response variables for the main claim made by Report 3A.

(b) Report 3A claims that "For every hour that someone watched [television] per day, they [students] showed a drop of nine GCSE points in total."

Describe the statistical analysis that could have been used to make this claim, and discuss what other information you would need to evaluate this claim.

ASSESSOR'S USE ONLY (c) Report 3A states that even when taking into account other factors, "... we found that teenagers with higher screen time had lower GCSE grades ...".

Identify ONE potential confounding variable that may have needed to be taken into account, and discuss how this variable may have been confounding.

Question Three continues on the following page.

(d) Report 3A is the original article published and Report 3B is a summary about the report written by another person.

Compare the headlines for Reports 3A and 3B.

Explain which headline is more appropriate, by referring to the type of study carried out.

Write the question number(s) if applicable.	

QUESTION NUMBER	Extra paper if required. Write the question number(s) if applicable.	ASSESSO USE ON
		_
		_
		-
		-
		-
		-
		_
		_
		-
		-
		-
		-
		-
		_
		_
		_
		_
		-
		-
		-
		_
		_

QUESTION NUMBER	Extra paper if required. Write the question number(s) if applicable.	ASSE	ESSOR' E ONLY
NUMBER			

QUESTION	I	Extra paper if required. Write the question number(s) if ap	oplicable.	ASSESSOR USE ONLY
QUESTION NUMBER				