Level 3 Statistics: practice paper 2026

AS 91584 Evaluate statistically based reports · Vertex Academy practice paper, not an NZQA paper

Attempt ALL the questions. Show ALL working. Use NZQA's Level 3 formulae sheet. Write your answers on lined paper, or in the space under each question.

QUESTION ONE

Report 1: Phones in bed

This report is fictional. It was written for this practice paper, and its organisations and figures are made up.

Kōtuku Research surveyed a random sample of 1100 New Zealand adults by phone and online in August, asking about their phone habits.

Main findings: 57% of New Zealand adults use their phone in bed every night.

Asked what they do first thing in the morning, 44% said they check their phone, 31% said they make a hot drink, and the rest gave other answers.

Of the 400 adults aged under 35 in the sample, 66% use their phone in bed every night, compared with 52% of the 700 adults aged 35 and over.

Each person answered the question: "Like most New Zealanders, do you use your phone in bed every night?"

(a) (i) Use the rule of thumb to calculate the margin of error for the whole survey of 1100 adults.
(ii) Explain why a margin of error is needed when reporting the results of this survey.

(b) Construct an approximate 95% confidence interval for the proportion of New Zealand adults who use their phone in bed every night, and write an inference statement in context.

(c) The report claims: "More New Zealand adults check their phone first thing in the morning than make a hot drink."
Use an appropriate confidence interval to evaluate this claim.

(d) A news website used the report to claim: "Younger New Zealanders are more likely to use their phone in bed every night than older New Zealanders."
Use an appropriate confidence interval to evaluate this claim, and write an inference statement in context.

(e) Look at the wording of the question in Report 1, and at how the survey was carried out.
Discuss TWO possible sources of non-sampling error in this survey, and how each could have affected the 57% result.

QUESTION TWO

Report 2: A walk after lunch

This report is fictional. It was written for this practice paper, and its organisations and figures are made up.

Researchers at a university in Hamilton wanted to know whether a short walk after lunch improves concentration in the afternoon. They put up posters asking for student volunteers, and 120 students took part.

Each student was randomly allocated to one of two groups of 60. After lunch, one group went for a 10-minute walk outside; the other group sat quietly in a lounge for 10 minutes.

All students then did the same 15-minute concentration test, at 1:30 pm on the same day. The tests were marked by a research assistant who did not know which group each student was in.

The mean test score was 74 for the walking group and 68 for the sitting group. The researchers concluded: "A short walk after lunch improves afternoon concentration."

The report also included a second finding from a questionnaire: students who said they walk to classes most days had a higher mean grade than students who said they drive or take the bus.

(a) (i) Explain why the walking study is an experiment, not an observational study.
(ii) Identify the explanatory variable and the response variable in this experiment.

(b) Explain why the researchers randomly allocated the students to the two groups.

(c) The tests were marked by a research assistant who did not know which group each student was in, and every student did the same test at the same time.
Explain how each of these features helps the experiment.

(d) A health magazine reported the experiment with the headline: "A walk after lunch will boost concentration for all New Zealanders."
Discuss ONE issue with extending the results of this experiment to support the magazine's claim.

(e) The report's second finding was that students who walk to classes most days had a higher mean grade than students who drive or take the bus. A student newspaper concluded: "Walking to class makes you get better grades."
Evaluate this conclusion.

QUESTION THREE

Report 3: The Te Awa cycleway

This report is fictional. It was written for this practice paper, and its organisations and figures are made up.

Te Awa District Council is deciding whether to build a cycleway beside its main river. The council wanted to know what the district's adult residents think.

Survey A: the council put an online form on its Facebook page for four weeks. 2500 people filled it in, and 64% supported the cycleway. A council press release said: "With 2500 responses, our margin of error is only 2%."

Survey B: a research company phoned a random sample of 600 adults on the electoral roll for the district. 47% supported the cycleway, and 12% said they cycle to work at least once a week.

(a) For Survey A, identify the target population and the sampling frame, and describe ONE way they do not match.

(b) Survey A found 64% support but Survey B found 47% support.
Explain why Survey A's result is likely to be biased, and suggest why it is higher than Survey B's.

(c) A student used the rule of thumb to give a 95% confidence interval for the percentage of adult residents who cycle to work at least once a week: 12% ± 4.1%.
Explain why the rule of thumb is not suitable here, and what effect it has on the interval.

(d) A councillor claims: "Survey B shows that a majority of the district's adult residents support the cycleway."
Use an appropriate confidence interval from Survey B to evaluate this claim, and write an inference statement in context.

(e) Evaluate the council's statement about Survey A: "With 2500 responses, our margin of error is only 2%."

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