NZQA

Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Numeracy 2024 – Term 2

32406 Use mathematics and statistics to meet the numeracy demands of a range of situations

EXEMPLARS

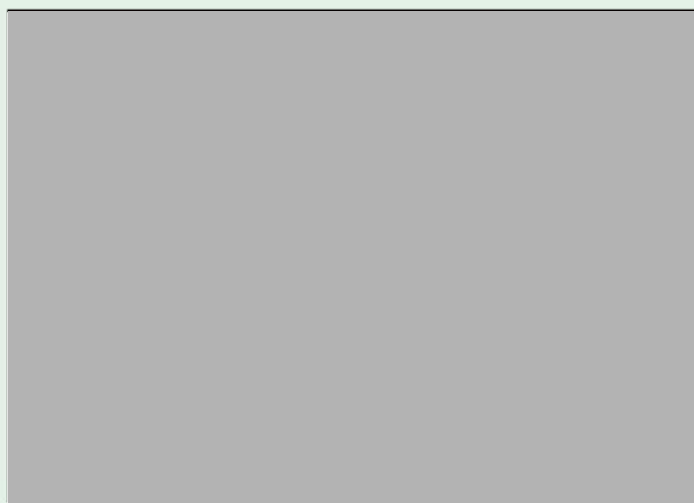**Sample exemplars of acceptable candidate responses to Outcome 3 questions**

Outcome 3 Exemplar Responses Term 2 2024

Question 1c

Tuatara are endangered.

A breeding programme for tuatara has been set up.

A female tuatara lays 6–10 eggs every four years.
The eggs take 11–16 months to hatch.

A tuatara hatching from an egg

(c) If all the eggs survive, about how many tuatara would you expect to get from **one** female in 10 years?

Show the calculations you used to get your answer. Type your answer in the box.

B *I* U ≣ ∨ ≣ ∨ ↶ ↷ ⑦ Spell Check

6-10 average is 8 (*meaning years*). 10 years divided by 4 = 2.5 (*laying cycles*) but they lay eggs every 4 years so they will lay 16 eggs in 8 years and it will have just enough time to hatch before the 10 year mark making them have 16 tuataras alive.

The assumption and calculation of average eggs per lay are correct. The student has considered hatching time in their final estimate and recognised that 2.5 laying cycles means only 2 full cycles are possible.

Strong achieved

AND:

B *I* U ≣ ∨ ≣ ∨ ↶ ↷ ⑦ Spell Check

12-20 eggs is 8 years in total and there is 2 years left so half 6 and 10 will give 3-5.

15-25 eggs in 10 years.

The initial calculations are correct, but the student has incorrectly assumed that the laying periods and egg counts can be halved, "half of 6 and 10 will give you 3-5."

Borderline achieved.

Question 1e

In 2003, 60 adult tuatara were released on Tiritiri Matangi Island. Ten years later, 31 tuatara were found, and their body lengths were measured. The dotted line is the median body length.

Lengths of 31 tuatara from Tiritiri Matangi Island 2013

Length (mm)
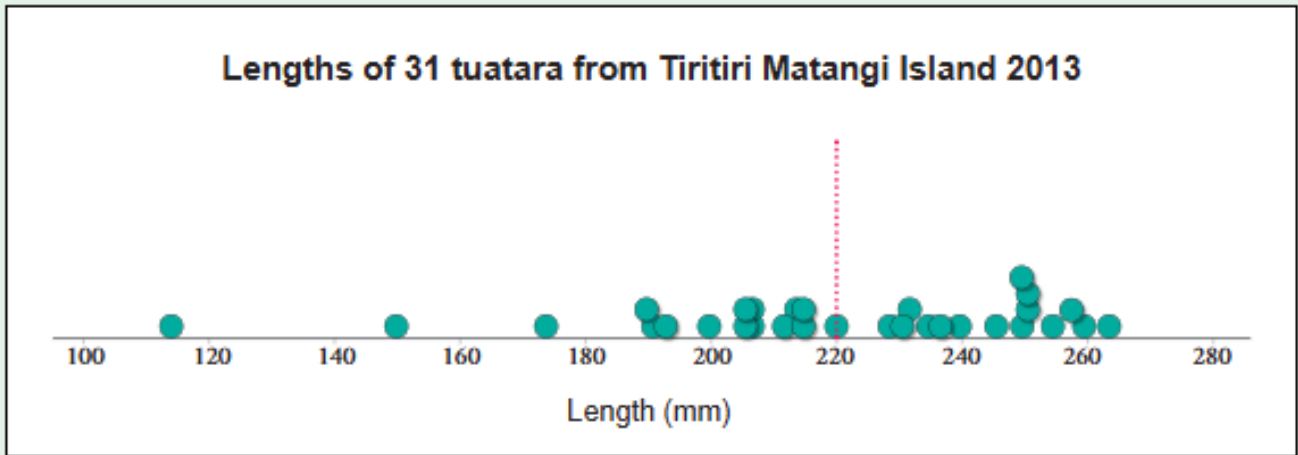
(e) Does the graph suggest that there are now young tuatara on the island?

Explain your answer using numbers from the graph. Type your answer in the box.

B *I* U ≡ ∨ ≡ ∨ ↺ ↻ ⦻ Spell Check

No, there is not enough information to determine if it suggests young Tuataras are now on the island. The smallest Tuatara is between 100-120 mm in length, being a pretty big outlier. Though just because it is small does not mean it is young.

'Outlier' is used to describe the smallest tuatara, indicating attention to the main cluster and centre. A range of correct lengths are read from the graph. A good contextual link is made to conclude that short does not necessarily mean young.

AND:

B *I* U ≡ ∨ ≡ ∨ ↺ ↻ ⦻ Spell Check

Yes. Most of the tuatara are over 190 mm but there are a few below that length which I would assume are young tuatara.

The student uses "Most of the..." so it can be inferred that they referenced the main cluster of lengths, and they provided one length measurement from the graph.

Question 2c

The diagram on the left shows fractions that are usually found in human faces.

Usual fractions in a human face   Cartoon of Richie McCaw's face

(c) In the cartoon, is the bottom of Richie's nose in the right place?

Use fractions from both the diagram and the cartoon to explain your answer. Type your answer in the box.

B *I* <u>U</u> ☰ ⌄ ☰ ⌄ ↶ ↷ ⓘ Spell Check

Yes, it is in the right place. The bottom of the nose should be in the 1/3 mark, seen in the normal human face. And the lines match up on the cartoon of Ritchie.

Accepts location of the nose. The student uses a fraction, "in the 1/3 mark" and compares the two graphics.

Question 3e

Tala's whānau want to use less water. There are six people in Tala's whānau.

Tala has two ideas for saving water:

- Cutting the daily shower time to two minutes per person.
- Running the washing machine once every two days rather than every day.

Activity	Estimated water use
Using a hose for 10 minutes	150 litres
Having a bath (half full)	80 litres
Having a shower (4 minutes)	48 litres
Having a shower (8 minutes)	96 litres
Running a washing machine (6 kg front loader)	60 litres

(e) Which of Tala's two ideas would save the most water? Explain your answer using information from the table.
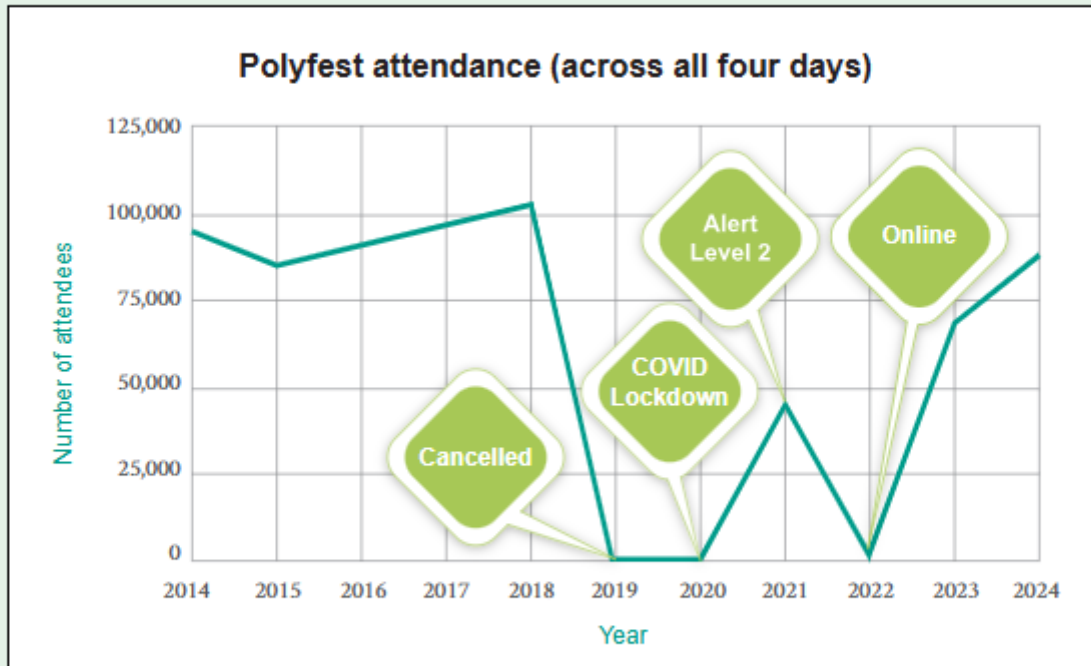

B *I* U ☰ ∨ ☰ ∨ ↶ ↷ ⑦ Spell Check

Cutting the daily shower time to two minutes because there are six people in Tala's household. If 6 people are using the shower for four minutes each, it will use 288 litres of water. However, if they cut down to 2 minutes each they will only be using 144 litres each. This will mean they are using half of what they were using before.

The student takes a position that cutting the shower time is best. They correctly calculate the daily saving. Comparison to reducing washing is not explicitly stated.

Question 4b

Polyfest organisers think that the festival will have around 100,000 attendees in 2025.

Polyfest attendance (across all four days)

(b) Do you agree or disagree with the organisers' comment? Explain your answer using information from the graph above. Type your answer in the box.

> Yes, I do agree. Even though the graph's numbers have been low recently, there are temporary reasons as to why. Before COVID, the festival had about 100,000 attendees per year. Since there isn't a reason for low attendance, I agree that in 2025 there will be about 100,000 attendees.

The student uses the pre-COVID numbers as an indication of long-term trend. They explain the low numbers are due to COVID and that this reason is no longer present.

AND

> Cannot tell, this is because the attendee numbers might go down because of another pandemic or weather condition as seen in 2019 and 2020 because of covid the polyfest had been cancelled.

The student explains the uncertainty of a prediction due to unforeseen circumstances, as had occurred previously.

Question 5c

Michaela played all **14 minutes** of a Rugby 7s game and ran a total of **1,540 metres**.

Ani says that, on average, Michaela ran over **100 metres** for every minute she played.
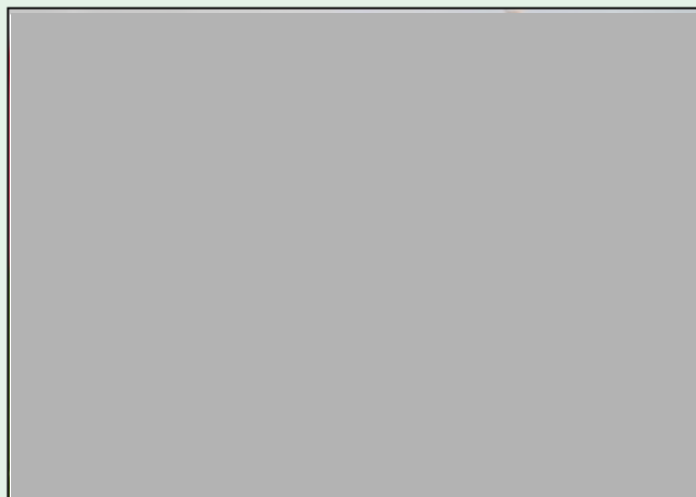
Michaela running

(c) Is Ani's claim reasonable? Use the measurements provided to explain your answer.
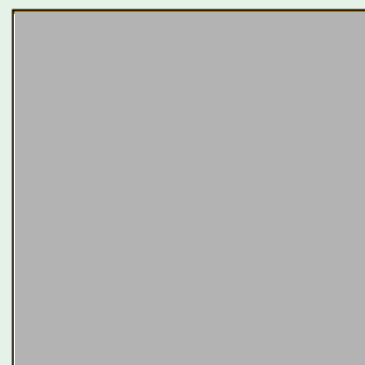
Type your answer in the box.

| B | I | U | ☰ ∨ | ☰ ∨ | ↶ | ↷ | ② | Spell Check |

It is reasonable but not exact she would run 110m every min.

It is reasonable to infer the student calculates 1540 ÷ 40 = 110 and knows that translates to 110 metres per minute. They refer to Ani's claim as not being exact so accept the speed estimation as reasonable

Question 5e

In a coin toss, Sarah usually picks "heads". But the last three tosses have all come up "tails".

Sarah tossing a coin

(e) Should Sarah choose "heads" or "tails" for the fourth toss, or is either choice acceptable? Explain your answer using ideas about probability. Type your answer in the box.

B *I* U ≣ ∨ ≔ ∨ ↶ ↷ ⑦ Spell Check

There is no way to tell what way it will land so it doesn't matter what one she picks because it's always going to be 50 50. I think either choice heads or tails is acceptable as they both have a 0.5% chance of each happening.

Position stated (either one) and justified using equally likely outcomes. There is no sign of considering previous outcomes, which would be an incorrect dependency.

Question 5f

The first Rugby 7s World Cup for men was in 1993. This table shows the placing of men's teams in the World Cup since 1993.

Team	1993	1997	2001	2005	2009	2013	2018	2022
Argentina	9th	13th	3rd	5th	2nd	11th	5th	5th
Australia	2nd	5th	2nd	3rd	10th	5th	10th	4th
Canada	15th	21st	5th	18th	13th	9th	12th	13th
England	1st	5th	5th	3rd	5th	2nd	2nd	9th
Fiji	3rd	1st	3rd	1st	5th	3rd	4th	1st
France	15th	5th	21st	5th	13th	5th	8th	6th
Hong Kong	17th	10th	21st	21st	19th	21st	18th	19th
New Zealand	7th	3rd	1st	2nd	5th	1st	1st	2nd
South Africa	5th	2nd	5th	5th	5th	5th	3rd	7th
United States	17th	18th	13th	13th	13th	13th	6th	11th
Wales	11th	13th	11th		1st	5th	11th	15th

The first and second teams played in the final. The following statement was made:
"New Zealand has been in the men's final for over 60% of the Rugby 7s World Cups."

(f) Is this statement true? Explain your answer using information from the table.

Type your answer in the box.

B *I* U ≣ ∨ ≔ ∨ ↺ ↻ ⓘ Spell Check

This statement is true, because 5/8 = 0.625.

0.625 can be converted into 62.5% so therefore it is correct.

The statement is accepted, and the position explained using calculations to show the exact percentage for 5 out of 8.

AND

Yes, that is correct because 60% of 8 is 4.8 and they won 5 games, not 4.8.

Position of agreement is correct. The student recognises that if 60% of 8 is 4.8 then 5/8 must be greater than 60%.