NZQA

Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Numeracy 2023

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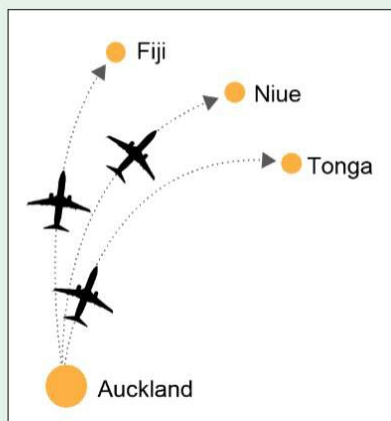
EXEMPLAR

Sample exemplars of acceptable candidate responses to Outcome 3 questions

Outcome 3 Exemplar Responses Term 4 2023

Question 1g

Three flights leave from Auckland airport. Olioli claims that compared to flight times to Fiji and Niue, the flight to Tonga takes the longest.

Destination	Leave (NZ time)	Arrive (NZ time)
Nadi (Fiji)	09:55	13:00
Nuku'alofa (Tonga)	11:25	14:15
Alofi (Niue)	08:15	11:45

(g) Is Olioli right? Use times to explain your answer.

no because from auckland to nuku alofa is 2 hours 50 minutes, nadi is 3 hours 5 minutes and alofi is 3 hours 30 minutes so actually the flight to tonga takes the shortest amount of time from auckland airport out of the three.

The student clearly states their position, that Olioli is **in**correct. The student argues that the flight to Tonga is the shortest, not the longest, which is supported by correct time calculations:

- Nadi (Fiji) flight takes 3 hrs and 5 mins (09:55–13:00)
- Nuku'alofa (Tonga) flight takes 2 hrs and 50 mins (11:25–14:15)
- Alofi (Niue) flight takes 3 hrs and 30 mins (08:15–11:45)

Question 2c

A game of basketball is 40 minutes long. The coach wants all 8 players to get equal time on court, but only 5 players can be on at one time.

The coach thinks that each player should get 30 minutes on the court.

(c) Is he right? Use calculations to justify your answer.

No he is incorrect because if you have 5 players over 8 players 5/8 and then you would multiply 5/8 by 40 minutes it will end up equalling to that each player would only get 25 minutes on the court. So my answer would be that all of the 8 players will only be able to get 25 minutes on the court.

The student takes a position, stating the coach is incorrect. They express the amount of time for each player as a fraction, $\frac{5}{8}$, of the whole 40 minutes. Finally, they state that as $\frac{5}{8} \times 40 = 25$ the equal share is 25 minutes.

Question 2e

Lucy plays basketball.

Including all games she has played, her average success rate for free throws is 50%.

Lucy is taking two free throws, one after the other. She is very confident that one of her shots will go in.

Lucy taking a free throw

(e) Do you think she is right? Explain your answer using ideas about chance.

> If you take a coin, and flip it, the chances or 50% that it will land on heads, and 50% to land on tails. This chance is the same as Lucy's free throw. So if you flip a coin twice, and want it to land on heads at least once, then you have a 50% chance happening twice. The chance of the coin landing on heads at least once is a 75% chance. So Lucy can Hope to make the throw but its not guaranteed. as there is still a 1/4 chance of failure.

The student likens the situation to tossing two coins. They correctly calculate the theoretical probability that Lucy has a 75% chance of landing at least one goal. In concluding the student acknowledges uncertainty by saying "Lucy can hope … but is not guaranteed."

Question 3d

The graph shows the amounts given by Mia's donors.

The amounts for school students and adults are shown in different colours.

Amounts given by Mia's donors

● School student
○ Adult

$0 $20 $40 $60 $80
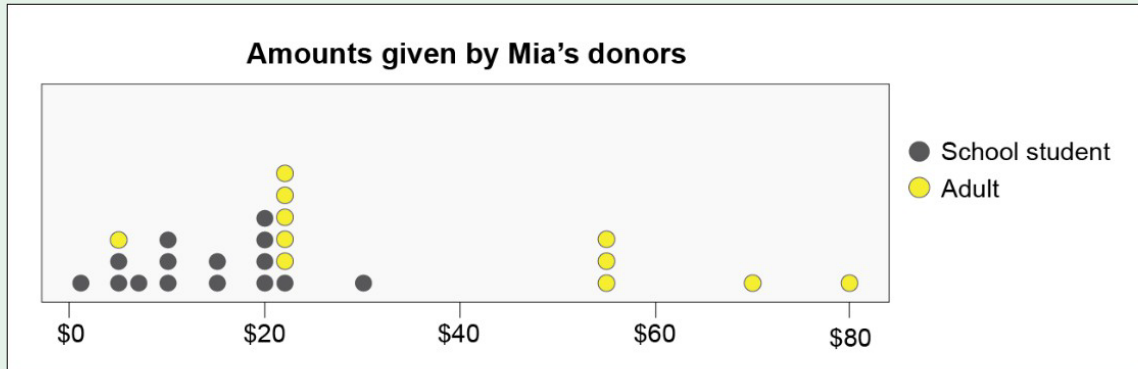
(d) How are the amounts donated by school students different from the amounts donated by adults?
Use numbers from the graph to support your answer.

The adults who donate tend to give larger sums of money, for example 3 gave around $55, 1 gave $70 and another gave $80. 5 adults also gave $20. The school students who donated mostly gave anywhere from $0 - $20 making their average lower.

The student clearly states that adults generally give more than school students. They use clustering when stating that students 'mostly' give in the range 0 – $20. Specific examples of adult donations are given to support the argument that the average for students is lower than that for adults.

Question 4c

On average, a dairy cow walks about 12,000 steps per day. Each step measures about 1.6 metres.

A farmer claims that each of her dairy cows walks 20 km per day.

(c) Is her claim reasonable? Write a calculation that supports your answer.

Yes, his claim is reasonable as I calculated the cow walks 19200m per day which converted to kilometres is 19.2km. So yes this is a reasonable estimate from the farmer

Calculations:
12000x1.6= 19200
19200/1000= 19.2
Answer = 19.2km

The student clearly states the claim is reasonable, as 19,200 m converts to 19.2 km which is close to 20 km (assumed from the statement). They support their argument with correct calculations.

Question 4f

The farmer's herd has 300 Holstein cows and 200 Jersey cows.

There is no pattern to which cow turns up first to be milked.

(f) The farmer says that there is a 60% chance that the first cow is a Holstein. Is she right?

Use fractions or decimals to explain your answer.

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> yes she is right because if you add 300 + 200 you get 500 and we can double that to make it simpler so 500 doubled is 1000 and we also double 300 which becomes 600 and 600 out of 1000 is 60%

The student takes an affirmative position. They demonstrate understanding of part-whole relationships in the ratio by expressing the proportion of Holstein cows as 300/500. Equivalent fractions and conversion of a fraction to a percentage are used to validate the farmer's claim, $\frac{300}{500} = \frac{600}{1000} = \frac{60}{100} = 60\%$.

Question 5a

Voting determines the people and parties that will be in parliament.

Elections in Aotearoa New Zealand happen every 3 years.

2023 is an election year.

Parliament buildings, Wellington

(a) Was 1987 an election year? Show the working you use to answer this question.

> yes , 2023-36=1987 , 3 x 12 = 36

Position of "Yes" is taken on the question. The student finds the difference between 2023 and 1987 equals 36 and supports their argument by showing that 36 is a multiple of 3.