To be completed by candidate

NSN | | | | | | | | | | |

School Code | | | | |

SUPERVISOR'S USE ONLY

32406 TERM 4

Draw a cross through the box (☒) if you have NOT written in this booklet ☐

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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

Credits: Ten

OUTCOMES	
1	Formulate mathematical and statistical approaches to solving problems in a range of meaningful situations.
2	Use mathematics and statistics to meet the numeracy demands of a range of meaningful situations.
3	Explain the reasonableness of mathematical and statistical responses to situations.

Enter your National Student Number (NSN) and School Code in the box at the top of this page.

You should attempt ALL the questions in this booklet.

Answer all parts of each question by filling in the gaps or selecting (✔) the correct answer.

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 2–19 in the correct order and that none of these pages is blank.

Do not write in any cross-hatched area (DO NOT WRITE IN THIS AREA DO NOT WRITE). This area will be cut off when the booklet is marked.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE ASSESSMENT.

QUESTION ONE: Navigating the Pacific

Māori sailed from places like Tahiti to settle in Aotearoa New Zealand.

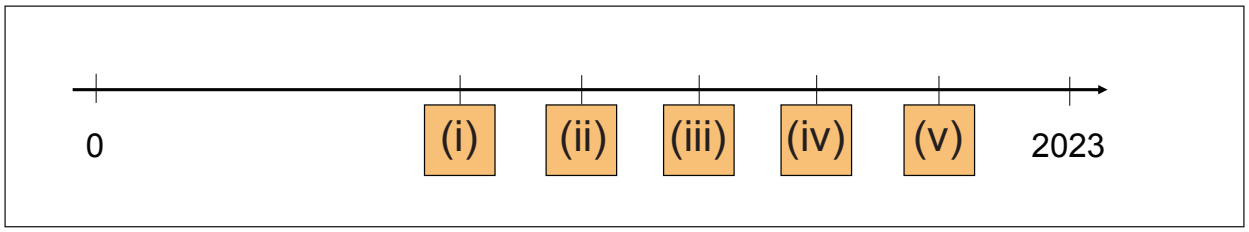
They came in waka hourua which are large canoes with twin hulls.

(a) Select (✔) the compass direction of the trip from Tahiti to Aotearoa New Zealand:

◯ West ◯ South ◯ South-east ◯ North-west ◯ South-west

This year it is 2023. Māori arrived in Aotearoa New Zealand around the year 1250.

That is almost 800 years ago.



(b) Select (✔) the answer that marks where 1250 would be on the timeline:

◯ (i) ◯ (ii) ◯ (iii) ◯ (iv) ◯ (v)

Vaka and waka are Polynesian words for boat.

A vaka is 22 metres long. A small outrigger canoe is 3.6 metres long.

Vaka (waka)

Small outrigger canoe

(c) How many times longer is the vaka than the small outrigger canoe?

_____ times longer

This map shows the route taken by a vaka on a journey from Auckland to Hawai'i.

(d) Using the scale on the map, which of the following estimates is closest to the total distance of the trip?

○ 5,000 km ○ 7,000 km ○ 9,000 km ○ 11,000 km ○ 13,000 km

The vaka is facing north.

Vaka surrounded by seven small islands

(e) Which island does the vaka face if it turns 135° clockwise without moving forward? Select (✔) your answer from the choices below.

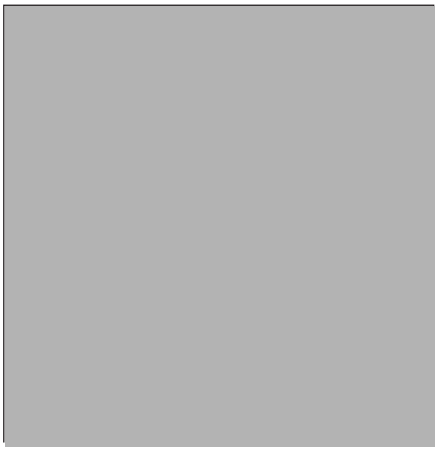
A	B	C	D	E	F	G
○	○	○	○	○	○	○

Hine dives for kōura (crayfish) on the sea floor. The sea floor is 17 metres below sea level.

(f) How many metres below sea level is Hine after she rises 8 metres from the sea floor? Write your answer as a negative number. For example, –2 means 2 metres below sea level:

_____ metres

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

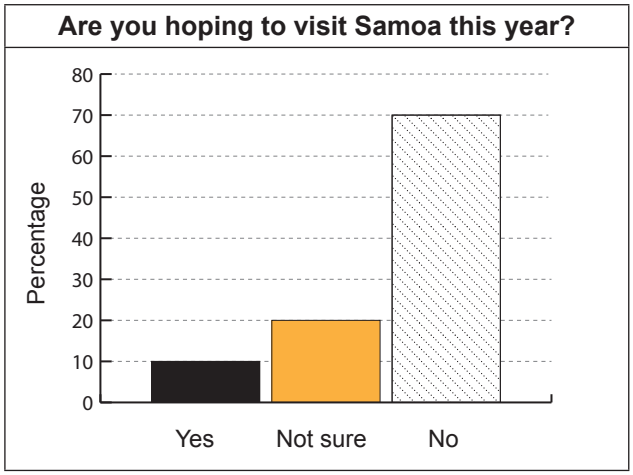


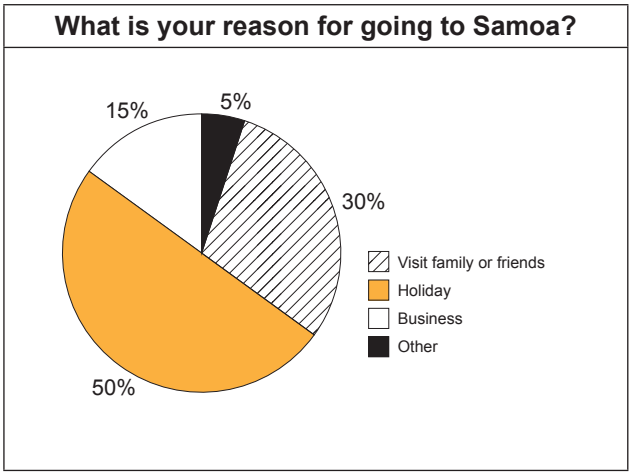
Destination	Leave (NZ time)	Arrive (NZ time)
Nadi (Fiji)	09:55	13:00
Nuku'alofa (Tonga)	11:25	14:15
Alofi (Niue)	08:15	11:45

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

1000 New Zealanders were asked, "Are you hoping to visit Samoa this year?" The people who said "Yes" were asked, "What is your reason for going to Samoa?"

These graphs show the data.





(h) Select (✔) all the statements that are **true about the 1000 New Zealanders**.
There is more than one answer.

- ◯ 10% of the people were hoping to visit Samoa this year.
- ◯ 200 people were not sure if they would visit Samoa this year.
- ◯ 500 people were hoping to visit Samoa to have a holiday.
- ◯ About ⅓ of the people hoping to visit Samoa this year were going to visit family or friends.

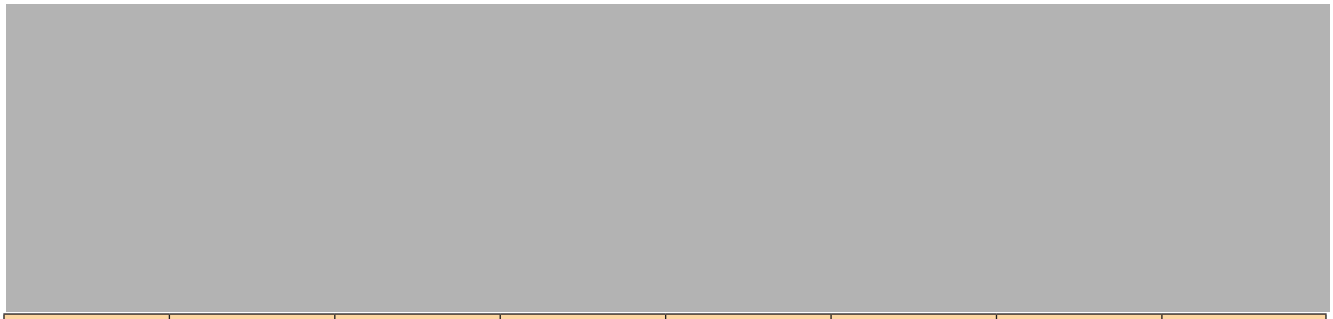
QUESTION TWO: Basketball

Here is a diagram of a basketball court that measures 15 metres in width and 28 metres in length.

(a) What is the area of the basketball court in square metres?

_____ m^2

Here are the players in a basketball team. Their heights are given in metres.



Nia	Ani	Kendra	Sue	Mere	Lucy	Tania	Sina
1.57 m	1.6 m	1.94 m	1.7 m	1.78 m	1.8 m	1.61 m	2.01 m

(b) Which two players need to swap places so that the heights are in order, shortest to tallest?

_____ and _____

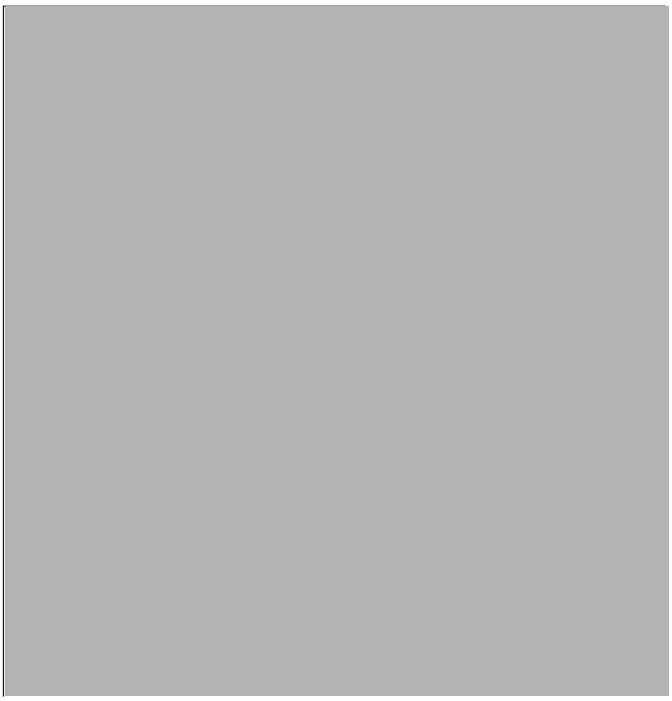
A game of basketball is 40 minutes long. The coach wants all 8 players to get equal time on court, but only 5 players can be on at one time.

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

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

The best angle for a jump shot is 48°.

(d) In the image below, circle the **arrowhead** that is closest to that angle.



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.

The graph shows the most popular sports among students in Aotearoa New Zealand in 2022.

(f) What was the approximate total number of boys and girls playing basketball in 2022?

QUESTION THREE: *Shave for a Cure*

Mia is shaving her hair to raise money for charity.

She is 1.72 metres tall.

The distance from her hair to the ground is 89 centimetres.

Mia

(a) What is the length of Mia's hair in metres?

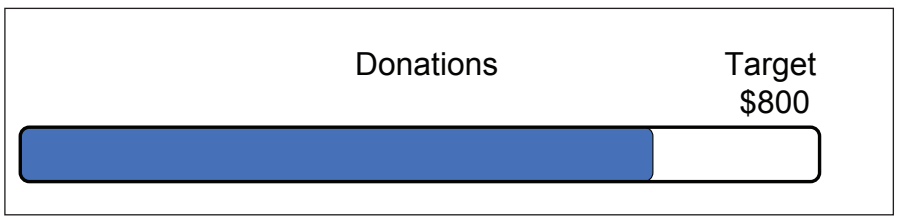
_____ m

Here are three options for donating to *Shave for a Cure*.

(b) How many *Transport to the hospital* donations will raise the same amount as **10** *Support person* donations?

_____

This bar shows the donations that Mia has received.

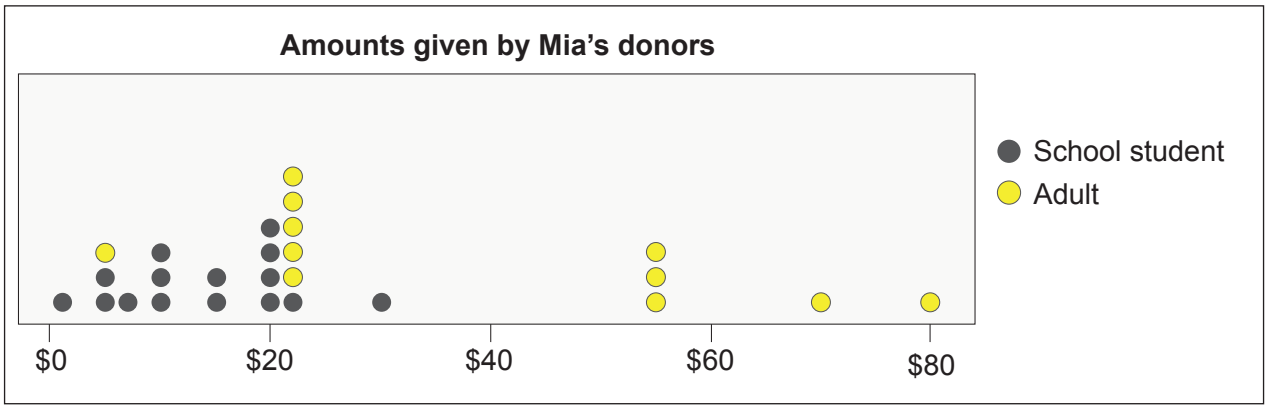


(c) About how much has Mia received in donations?

$ _____

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

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



(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.

Mia can sell her hair to a wig factory.

(e) If Mia sells 70 centimetres of her hair, how much money will she make?

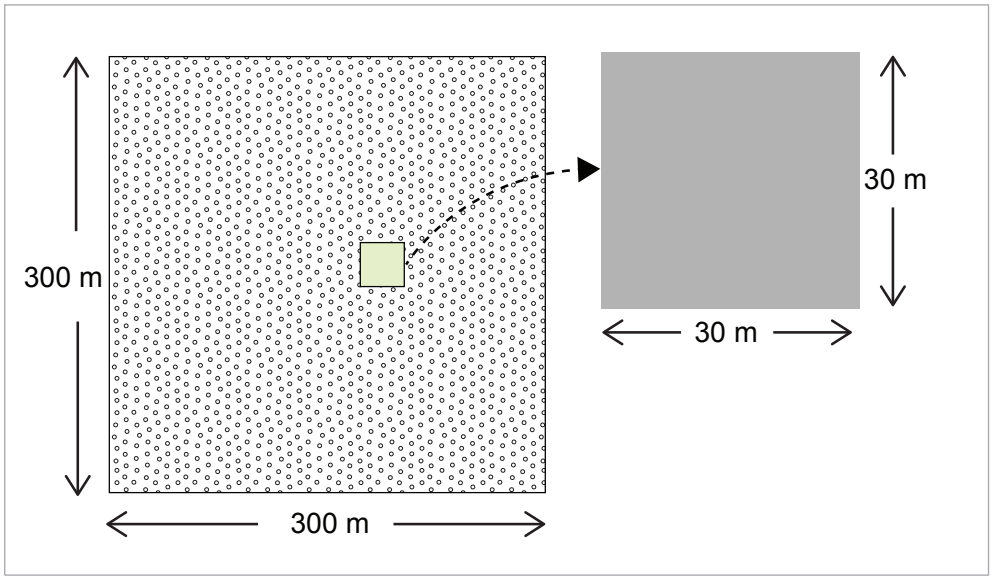
$ _____

QUESTION FOUR: Cows

The farmer's field measures 300 metres by 300 metres.

In a 30 metre by 30 metre section there are 5 cows.

The cows are evenly spread throughout the field.



(a) Estimate how many cows there are in the whole field:

_____ cows

Here is a picture of Daisy.

(b) Daisy sees her reflection in the water.

From the options below, select (✔) the picture that shows the reflection that Daisy sees.

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.

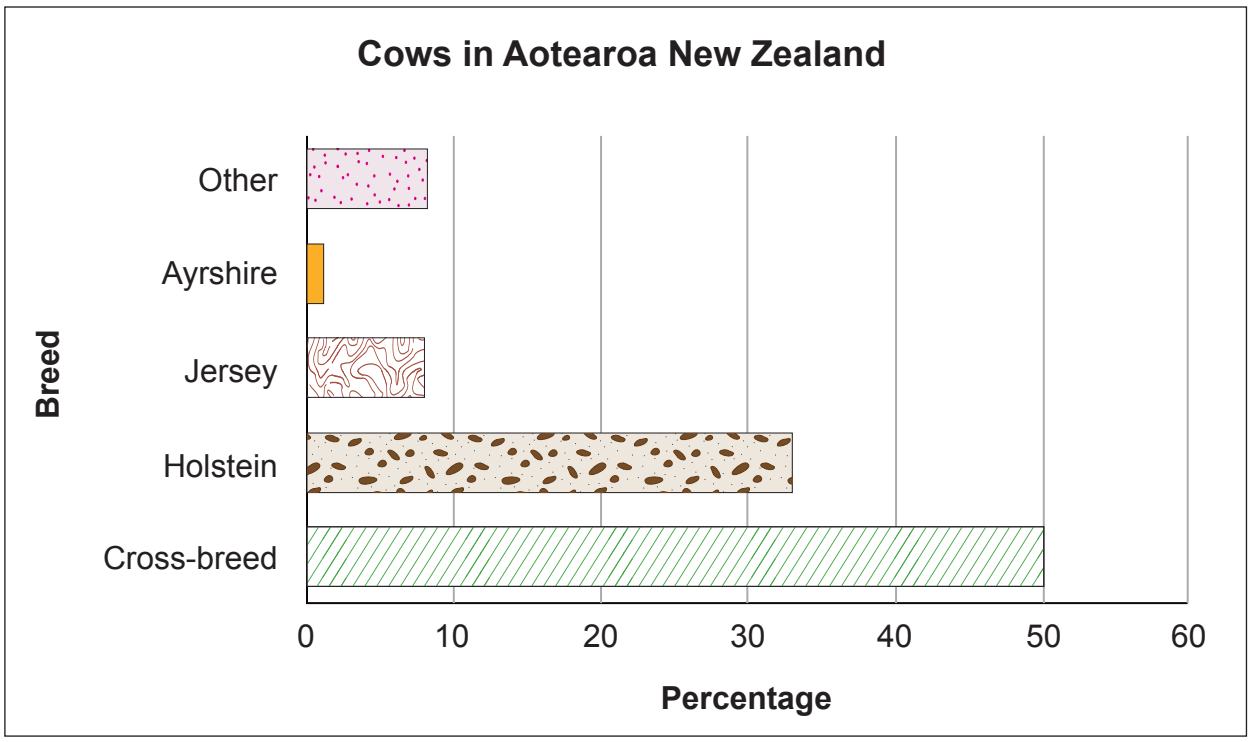
Mooloo, a cow, produces about 35 litres of milk per day.

A family uses 3 litres of milk every 2 days.

(d) Approximately how many days will 35 litres of milk last that family?

_____ days

There are about 6 million cows in Aotearoa New Zealand.



(e) Looking at the graph above, about **how many** cows in Aotearoa New Zealand are Jersey cows?

_____ Jersey cows

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.

QUESTION FIVE: Voting time

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.

There are 72 electorates in Aotearoa New Zealand. That includes 7 Māori electorates.

About 3,900,000 people can vote.

(b) Select (✔) the equation that gives the average number of people per electorate:

- 72 × 3,900,000 ◯
- 3,900,000 + 72 ◯
- 3,900,000 – 72 ◯
- 72 ÷ 3,900,000 ◯
- 3,900,000 ÷ 72 ◯

Electorate map of Aotearoa New Zealand

A political party is a group of people with similar ideas.

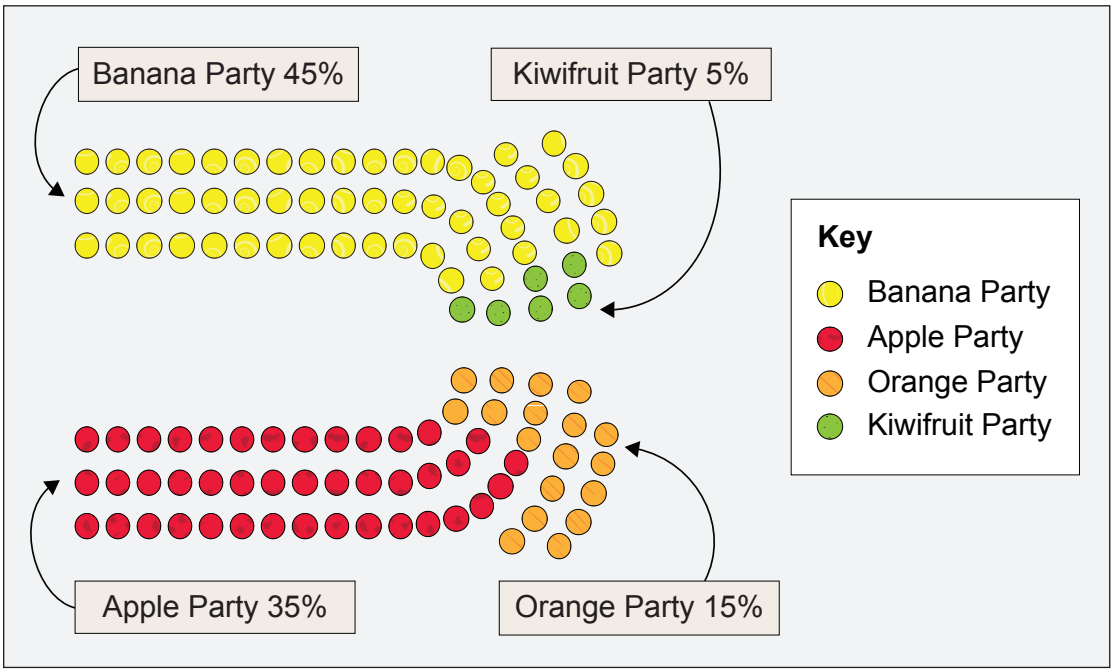
The Apple Party receives 35% of votes, so they get 35% of the 120 seats in parliament. That's 42 seats.

(c) How many seats does the Orange Party get?

_____ seats

To be the Government, parties need to work together and form a team called a coalition.

The team must have **over 50%** of the seats in parliament.



(d) Select (✔) all the teams that could form the Government:

- ◯ Banana and Orange Parties
- ◯ Apple and Banana Parties
- ◯ Apple and Orange Parties
- ◯ Orange and Kiwifruit Parties
- ◯ Kiwifruit and Banana Parties
- ◯ Orange, Kiwifruit, and Apple Parties

Every voter in Aotearoa New Zealand makes two choices. They vote for a **party**, and they vote for a **person**.

One combination is to vote for the Banana Party and Isaia Finaki. Another is the Orange Party and Henry Chote.

Party Vote	Person Vote
Apple Party	CHOTE, Henry
Banana Party	FINAKI, Isaia
Kiwifruit Party	JONES, Tayla
Orange Party	NUI, Rawiri
	PEREZ, Joe
	WANG, Chris

(e) How many different voting combinations are possible on this form?

_____ voting combinations

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

QUESTION NUMBER	

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

QUESTION NUMBER

Acknowledgements

Material from the following sources has been adapted for use in this assessment:

Question one

Polynesian migration, https://www.researchgate.net/publication/340980991/figure/fig1/AS:886207588343813@1588299762620/Schematic-map-showing-simplified-routes-of-human-aided-dispersal-of-Polynesian-rats.ppm
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Question four

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Holstein cow, https://img.freepik.com/premium-photo/holstein-cow-standing_191971-14133.jpg

Question five

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