

To be completed by candidate and school

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School Code

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**32406**



NEW ZEALAND QUALIFICATIONS AUTHORITY  
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD  
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## Numeracy 2021

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

Credits: Ten

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

**You should attempt ALL the questions in this assessment.**

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 2–15 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 ASSESSMENT.**

**QUESTION ONE: A walk around Lake Tikitapu**

Jess is driving from Rotorua to Lake Tikitapu. The dotted line on the map shows the road.



(a) In which direction is Jess driving?

East

South

South-east

South-west

(b) Use the scale on the map to estimate how many kilometres (km) Jess travels.

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(c) The walk around Lake Tikitapu is 3.6 kilometres long.

A friend says the walk takes about 25 minutes. Jess knows that medium walking speed is about 4 kilometres per hour.

Does the friend's estimate sound reasonable? Explain your answer.

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**QUESTION TWO: Buying taro**

- (a) Taro costs \$7.00 per kilogram.

What is the cost of a taro that weighs 510 grams?

\$2.83

\$3.57

\$4.28

\$5.10

- (b) A taro costs \$4.20. What is the weight of the taro in grams (g)?

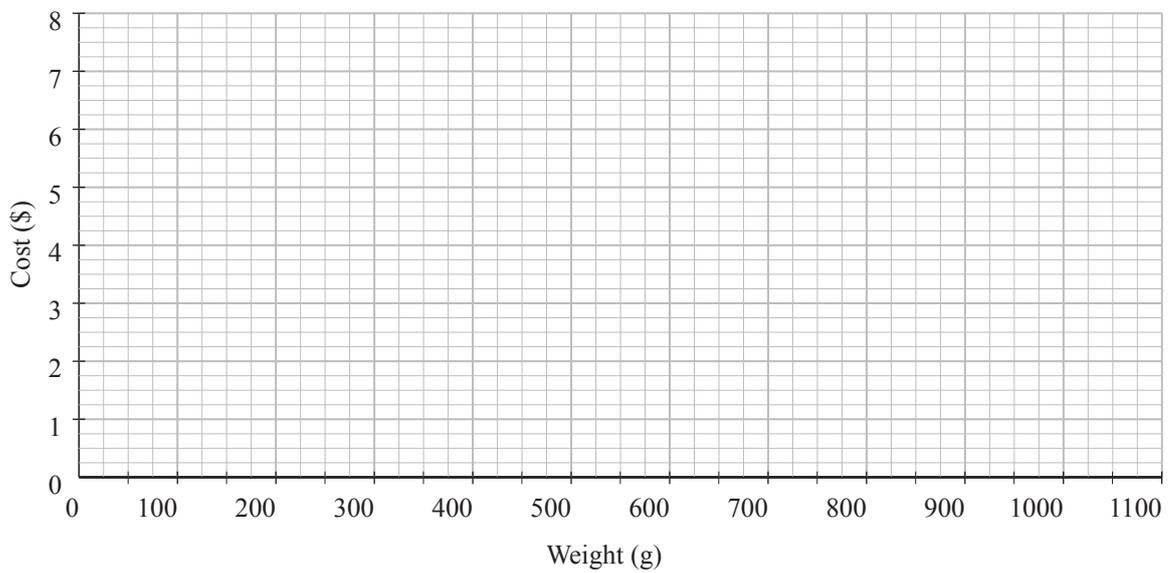
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- (c) This table shows the weights and costs of three taro.

Weight	Cost
500 g	\$3.50
1 kg	\$7.00
250 g	\$1.75

- (i) Mark the points for each taro on the graph below and draw a line through the points. Continue the line to the edges of the graph in each direction.



- (ii) Mark a fourth point that lies on the line with an ✕. Explain what this point shows about the cost of taro.

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**QUESTION THREE: Bank balances**

Sam works part-time while he studies. Below is his bank statement.

Bank of Aotearoa				
Date	Transaction	Debit	Credit/deposit	Balance
12 Feb 2021	Cafe Calypso Wages S Smith		\$410.25	\$847.89
13 Feb 2021	Rent	\$185.00		\$662.89
15 Feb 2021	Cash withdrawal	\$200.00		\$462.89
16 Feb 2021	Speydon Garage Petrol	\$15.00		\$447.89
17 Feb 2021	3Degrees mobilephone monthly	\$49.90		\$397.99
18 Feb 2021	Teina motorcycle repairs	\$506.40		-\$108.41
19 Feb 2021	Cafe Calypso Wages S Smith		\$516.90	

**Debit** means money goes out of Sam's account.

**Credit/deposit** means money goes into his account.

**Balance** means how much money is left in his account.

(a) Why does Sam have a balance of -\$108.41 at the end of 18 February?

- There is \$108.41 left in his account.
- He owes the bank \$108.41.
- The bank charges a fee of \$108.41.
- Sam has \$108.41 in bills that must be paid.

(b) The balance at the end of 19 February is missing. What is the new balance?

\_\_\_\_\_

(c) Should Sam be worried that he is spending more than he earns?

- Yes     No     Can't tell for sure

Explain your answer, using information from the bank statement.

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**QUESTION FOUR: Whale watch Kaikōura**

This table shows the number of whale sightings for March.

Whale species	Number of sightings
Sperm	108
Orca	75
Humpback	4
Other	14



- (a) Select the graph types below that are suitable for displaying the whale data.

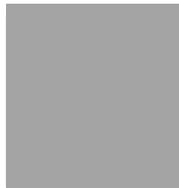
There is more than one correct answer.



Line graph



Strip graph



Scatterplot

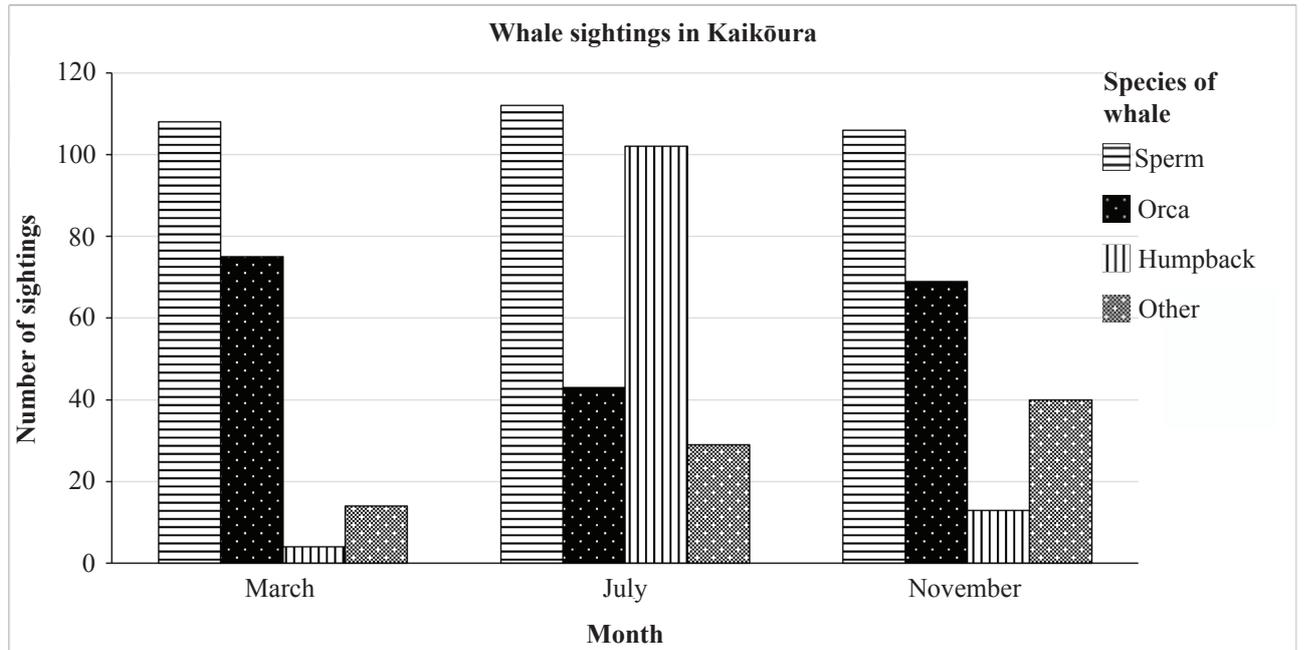


Pictograph



Dot plot

(b) Data of whale sightings for three different months are shown in the graph below.



(i) In which month do you have the best chance of seeing all species on a whale watching trip?

- March
- July
- November
- Any of the three months

(ii) Sperm whales and orca have teeth. Humpbacks do not.

Which two months have the most sightings of toothed whales?

\_\_\_\_\_ and \_\_\_\_\_

Support your answer with information from the graph.

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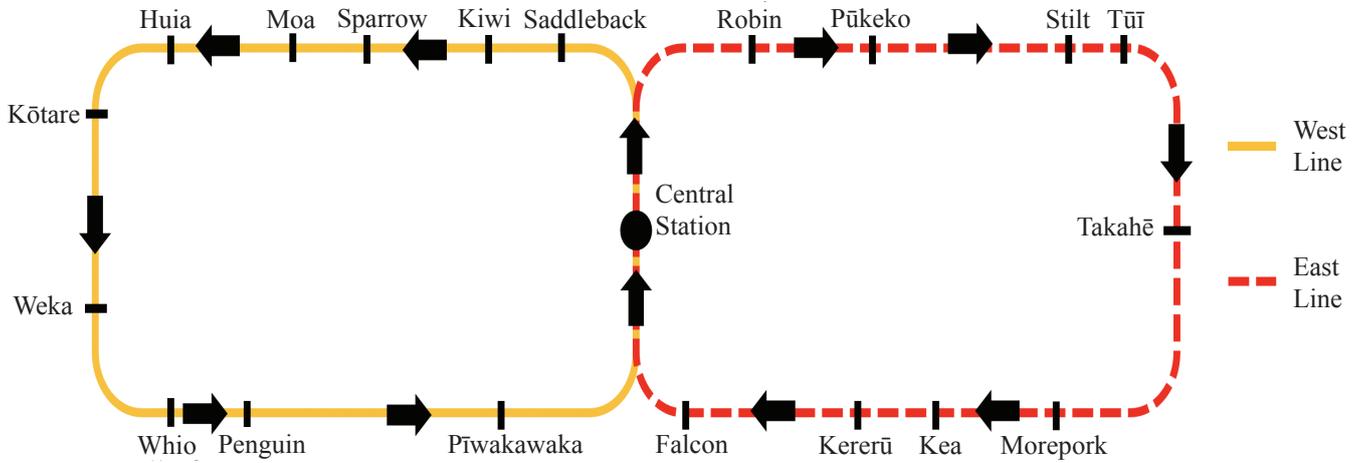
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### QUESTION FIVE: Getting there

Below is a diagram of a train network. Each mark (|) is a station.



- (a) You catch the train at Kiwi station on the West Line and get off at Penguin station. The train stops at every station.

How many stops are **between** Kiwi and Penguin Stations? (Do **not** include Kiwi and Penguin.)

- 4
- 5
- 6
- 9
- 10

(b) Here is part of the train timetable for the West Line.

	Central Station	Saddleback	Kiwi	Sparrow	Moa	Huia	Kōtare	Weka	Whio	Penguin	Pīwakawaka	Central Station
Monday to Friday	07:40	07:45	07:48	07:51	07:53	07:55	07:58	08:04	08:07	08:10	08:14	08:20
	08:00	08:05	08:08	08:11	08:13	08:15	08:18	08:24	08:27	08:30	08:34	08:40
	08:20	08:25	08:28	08:31	08:33	08:35	08:38	08:44	08:47	08:50	08:54	09:00
	08:40	08:45	08:48	08:51	08:53	08:55	08:58	09:04	09:07	09:10	09:14	09:20
	09:00	09:05	09:08	09:11	09:13	09:15	09:18	09:24	09:27	09:30	09:34	09:40
	09:20	09:25	09:28	09:31	09:33	09:35	09:38	09:44	09:47	09:50	09:54	10:00
	09:40	09:45	09:48	09:51	09:53	09:55	09:58	10:04	10:07	10:10	10:14	10:20
	10:00	10:05	10:08	10:11	10:13	10:15	10:18	10:24	10:27	10:30	10:34	10:40
	10:20	10:25	10:28	10:31	10:33	10:35	10:38	10:44	10:47	10:50	10:54	11:00
	10:40	10:45	10:48	10:51	10:53	10:55	10:58	11:04	11:07	11:10	11:14	11:20
	11:00	11:05	11:08	11:11	11:13	11:15	11:18	11:24	11:27	11:30	11:34	11:40

You want to get to Penguin just after 10:00 am.

(i) At what time should you catch the train at Kiwi?

\_\_\_\_\_

(ii) How long will the train journey take between Kiwi and Penguin?

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**QUESTION SIX: Are netballers getting taller?**

(a) This graph appears in a sports magazine.



What was the height (in cm) of the tallest player in the 1987 squad?

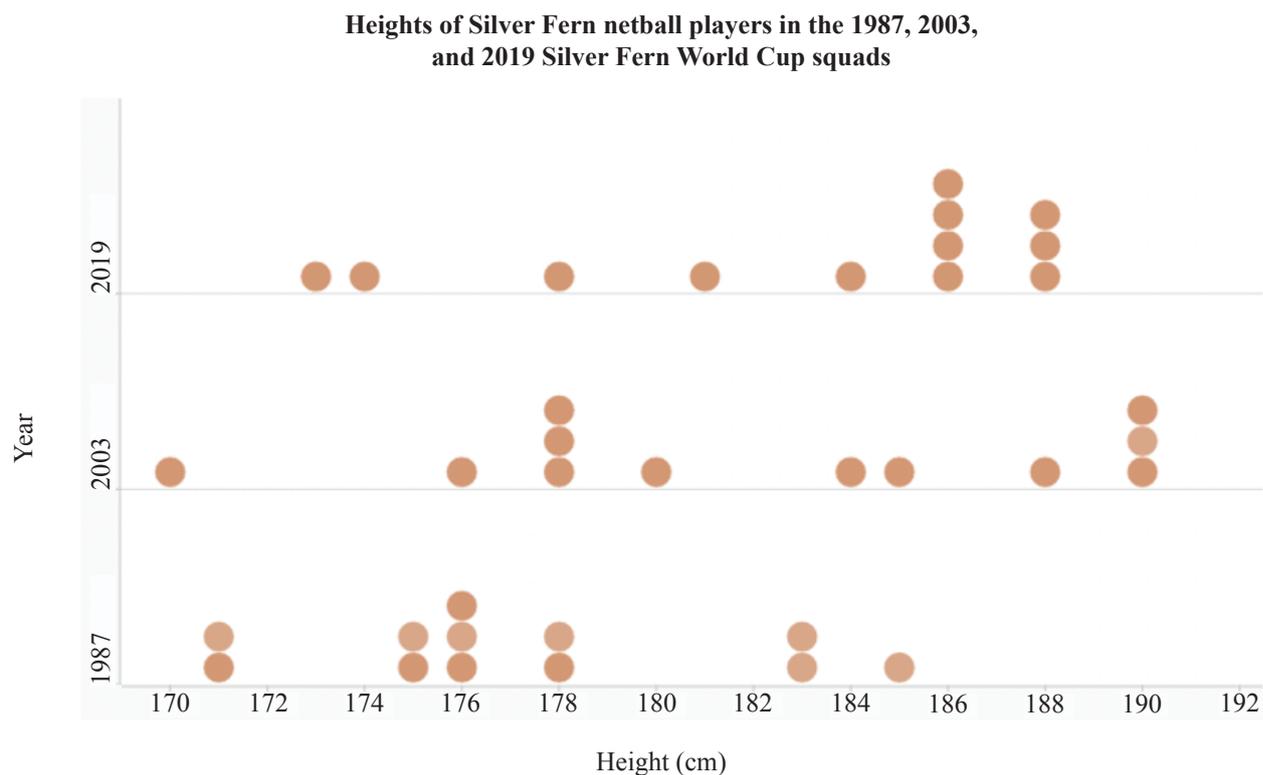
- 176
- 184.5
- 185
- 190
- 2.85

(b) This graph shows the heights of players in the 2019 squad.



On the horizontal axis, mark the median height of players in the 2019 squad with an **x**.

- (c) This graph shows the heights of players in the 1987, 2003, and 2019 squads.



The sports magazine article says, “The height of Silver Fern netballers has increased over the last 32 years.”

Explain why you agree or disagree with this statement, or cannot decide. Use information from the graph to support your answer.

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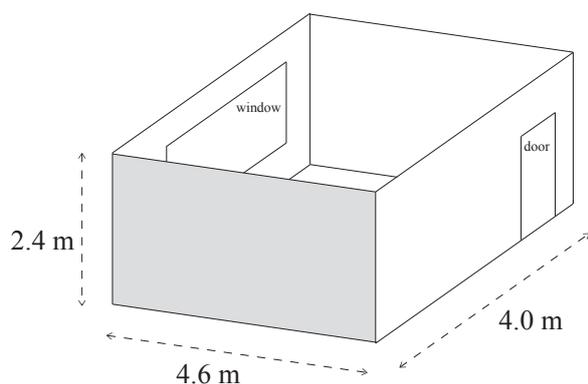
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**QUESTION SEVEN: Lisa paints**

- (a) Lisa wants to paint her bedroom. The dimensions are shown below.



What is the area, in square metres ( $\text{m}^2$ ), of the shaded wall of Lisa's room?

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- (b) Lisa knows that 1 litre of paint will cover  $6.7 \text{ m}^2$ . The ceiling has an area of  $18.4 \text{ m}^2$ .

What calculation should Lisa perform to work out how many litres of paint she needs to paint the ceiling?

$18.4 \times 6.7$

$18.4 \div 6.7$

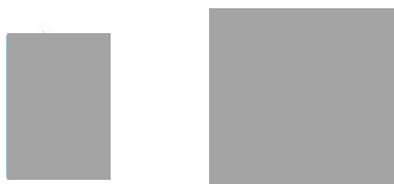
$6.7 \times 6.7$

$18.4 + 6.7$

- (c) Lisa also wants to create this pattern on one wall.



She has five leaf-shaped stickers. After placing the first sticker, she turns the next one clockwise, as shown below.



On what angle does she need to turn the sticker?

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**Acknowledgements**

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

**Question One**

Google Maps

**Question Three**

Image: <https://tewahanui.nz/culture/quality-claim-root-cause-of-double-digit-cost>

**Question Five**

Image: <https://newzealandsafaris.com/activities/>

Line graph: Nice and Serious from the Noun Project.

Strip graph: Severino Rebecca from the Noun Project.

Scatterplot: myiconfinder from the Noun Project.

Pictograph: <https://nbcmathsfs.wordpress.com/2013/09/15/reading-pictographs/>

Dot plot: Blaise Sewell from the Noun Project

**Question Nine**

Image: <https://freerangestock.com/photos/139895/hip-hop-dancer.html>

**Question Ten**

Image: <https://www.shutterstock.com/image-vector/palm-leaves-set-black-white-vector-1704402988>

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