

To be completed by candidate

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School Code

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32406

TERM 2



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

Numeracy 2022

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

Credits: Ten

PILOT ASSESSMENT

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 2–20 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: Eggs

This table shows how eggs are graded by minimum weight

Grade	4	5	6	7	8
Weight	35 g +	44 g +	53 g +	62 g +	68 g +

(a) What grade is an egg that weighs 60 grams?

Grade 4

Grade 5

Grade 6

Grade 7

Grade 8

(b) Calculate the minimum weight of one dozen (12) eggs that are grade 7.



Picture of one dozen (12) eggs

(c) On average, New Zealanders eat about 250 eggs each per year. The population of New Zealand is just over 5 million people.

Here is a headline from a newspaper:

IT'S NO YOLK!

New Zealanders eat over 1 billion eggs per year.

Is the headline realistic? Explain your answer using the information provided in part (c).

QUESTION TWO: Making Muffins

Aloma wants to use the following ingredients to make 12 white chocolate raspberry muffins.

- 2½ cups self-raising flour
- 100 g butter
- 1 cup sugar
- 1 cup milk
- 1 egg
- 1 cup frozen raspberries
- 90 g white chocolate buttons

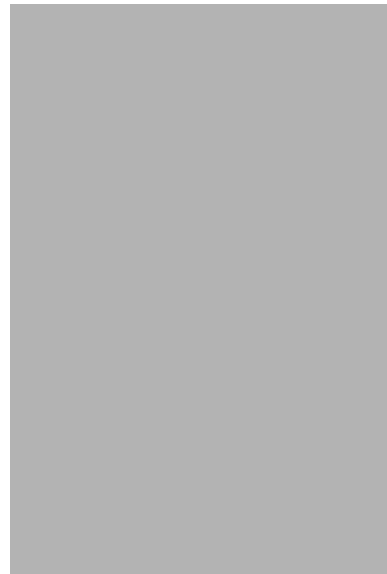
- (a) 1 cup of flour weighs 125 grams. Aloma has a 1.5 kg bag of flour. How many cups can she fill from the 1.5 kg of flour?

_____ cups

- (b) At the supermarket, Aloma finds two different brands of white chocolate buttons.

Blanco Buttons

100 grams for \$1.40

Wit Buttons

290 grams for \$3.60

Which is the best buy for Aloma – Blanco Buttons or Wit Buttons?

Explain your answer using the price information above.

(c) The recipe only makes 12 muffins. Aloma needs to make enough muffins for 30 people. How can she alter the amount of ingredients to give every person at least one muffin?

- Add 150 g to each amount of ingredient
- Add 1.5 cups to each amount of ingredient
- Multiply each amount of ingredients by at least 2.5
- Divide each amount of ingredients by 1.5 or more
- Double each amount of ingredients

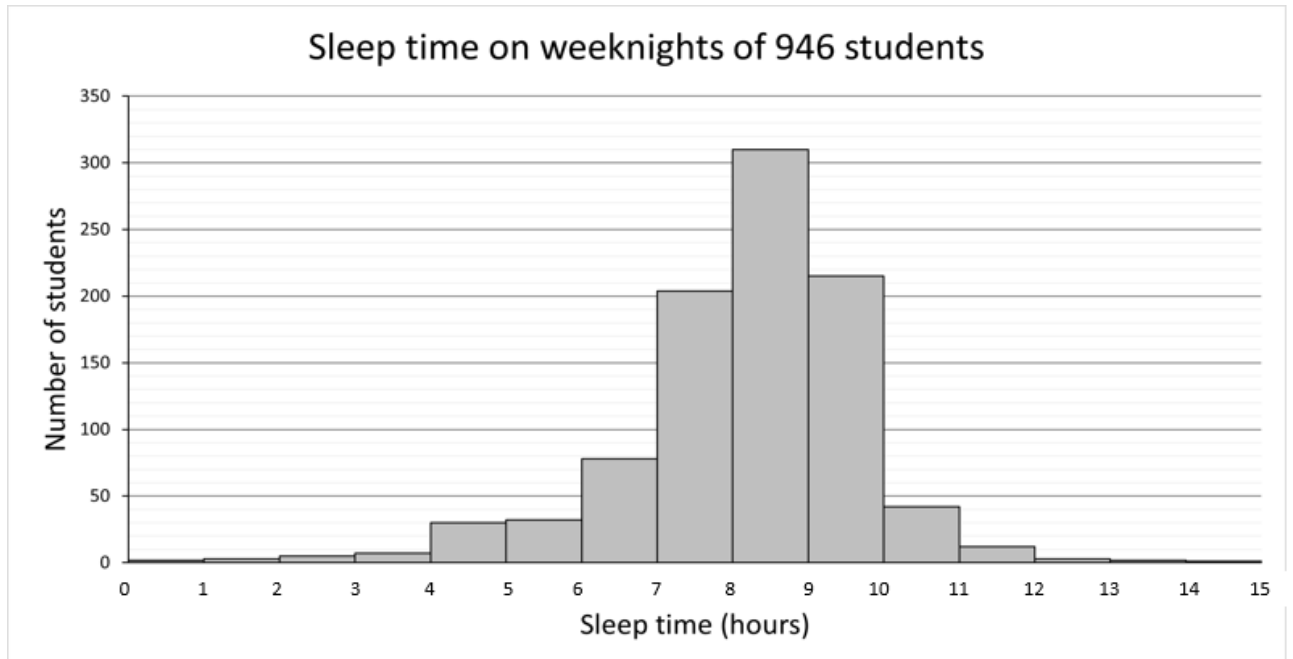
QUESTION THREE: Enough Sleep?

- (a) Dallas goes to sleep at 9.30 pm and wakes up at 7.15 am the next morning.
How long does Dallas sleep for?

_____ hours

_____ minutes

- (b) Here is a graph that shows average sleep time for a sample of 946 Year 9 to 13 Students.



About what percentage of students in the sample of 946 said that they got less than 8 hours sleep each night?

_____ %

- (c) The Ministry of Health recommends that teenagers, aged 13–18 years, should get 8 to 10 hours sleep per night.

A friend of Dallas claims that only one half of the students in this sample get enough sleep.

Do you agree with the friend's claim? Explain your answer using information from the graph and the Ministry of Health recommendation.

QUESTION FOUR: Checking the Advertising

- (a) The admission prices at Kaitiakitanga Wildlife Park are as follows:

Adults	\$36.00
Children (5-15 Years)	\$10.50

In the school holidays the park offers a special deal for a family pass. The advertisement for the deal reads:

**\$80 Family Pass
Kaitiakitanga Wildlife Park
2 adults and up to 3 children
Save over \$20**

Is the advertisement true? Will a group that uses the family pass save money? Explain your answer using the advert and the pricing information.

- (b) Lara needs three notebooks for a course she is doing. The advertisement for the notebooks reads:

**Course Notebooks
\$2.99 each
Buy 1 and get 1 half price**

Should Lara buy four notebooks using the “Buy 1 and get 1 half price” deal or should she buy three notebooks for \$2.99 each? Explain your answer using the information provided above.

- (c) Flora sees the following advertisement for jackets.

**25% OFF
Now \$59.99
Save \$21.00**

Flora knows the usual price of the jacket is \$80.99. Which of the following statements is correct?

- The advertised price is exactly 21% off.
- The advertised price is less than 25% off.
- The advertised price is 25% off.
- The advertised price is more than 25% off.

QUESTION FIVE: Winter Olympics

Zoi Sadowski-Synnott – New Zealand snowboarder

Zoi Sadowski-Synnott represented New Zealand in snowboarding at the 2022 Winter Olympics. A single trip down the course is called a run. On one run, Zoi attempted a 1260 jump. That means she tried to turn 1260° before landing.

(a) How many full and part rotations are in a 1260 jump?

2

$2\frac{1}{2}$

3

$3\frac{1}{2}$

4

(b) Zoi's first run was scored by six judges from different countries. To get an overall score for the first run, the highest and lowest numbers were removed (Japan and Canada's scores have been removed).



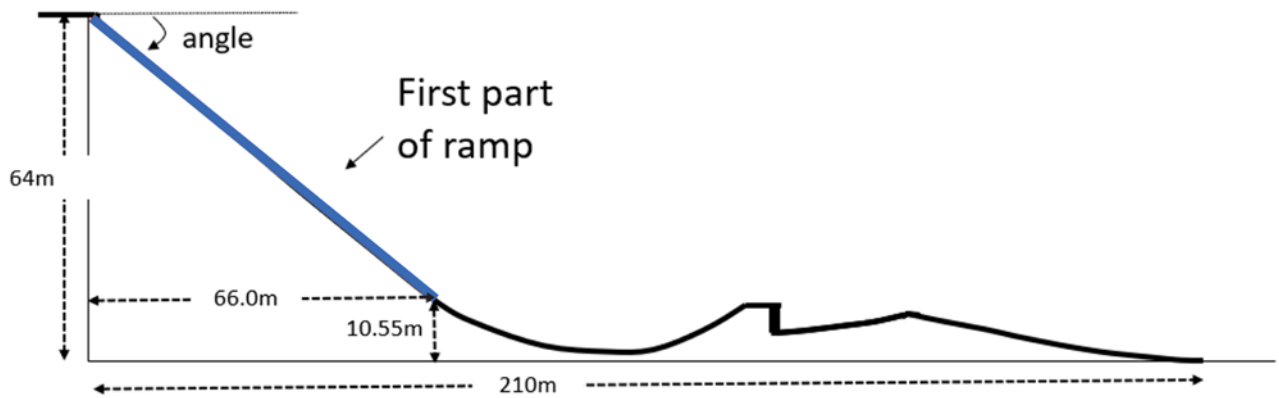
Japan	France	USA	Australia	Canada	Switzerland
	93	94	93		93

Zoi's score was the average of the remaining four numbers. What score did Zoi get for her first run?



Big Air ramp is lit up at Shougang Park

- (c) Below is a side on view of the 'Big Air' ramp. The diagram is NOT to scale.











A presenter speaking on TV said that the first part of the ramp drops at an angle of about 40° . Is 40° a good estimate of the angle?

Explain your answer using information from the diagram.

QUESTION SIX: Huia catches the bus

Each weekday morning, Huia catches the bus from Rata to Graham where she works. Here is the timetable:

Green Bus Lines							
City to Graham Timetable							
City Centre	Rata	Clarke	Te Puia	Seddon	Kirk	Ngata	Graham
							
7:15am	7:23am	7:39am	7:51am	8:03am	8:17am	8:31am	8:42am
8:05am	8:13am	8:29am	8:41am	8:53am	9:07am	9:21am	9:32am
8:55am	9:03am	9:19am	9:31am	9:43am	9:57am	10:11am	10:22am
9:45am	9:53am	10:09am	10:21am	10:33am	10:47am	11:01am	11:12am
10:35am	10:43am	10:59am	11:11am	11:23am	11:37am	11:51am	12:02pm
11:25am	11:33am	11:49am	12:01pm	12:13pm	12:27pm	12:41pm	12:52pm

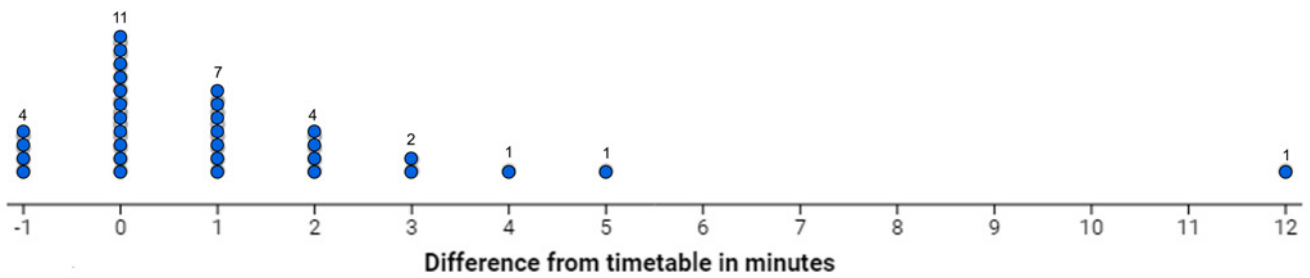
(a) How often does a bus leave the City Centre for Graham?

- Every 30 minutes
- Every 40 minutes
- Every 50 minutes
- Every hour
- Every 90 minutes

(b) How long does Huia's bus trip take from Rata to Graham?

_____ minutes

- (c) Huia likes to arrive at work early and has created a graph to record the arrival times of the 9:03 am bus at her stop.



A difference of -1 means the bus arrives one minute early.

Huia says, “The chance of the bus being on time, or early, is 50%”.

Do you agree with Huia? Explain your answer using information from the graph above.

QUESTION SEVEN: Buying Bananas

At Saffron's Fruit n' Veg Shop the price of bananas is \$2.70 per kilogram.

(a) What will a 750 g bunch of bananas cost, to the nearest cent?

\$1.80

\$2.03

\$2.25

\$4.73

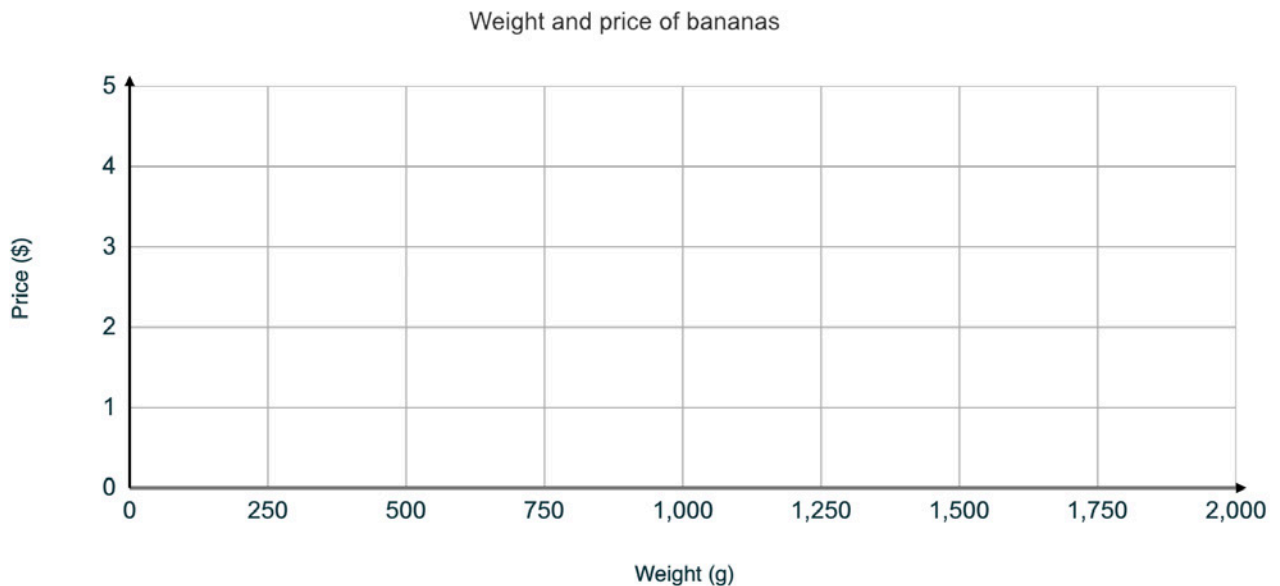
(b) What is the weight of a banana that costs \$0.50?

_____ grams

(c) This table shows the weights and prices of two bunches of bananas.

Weight	Price
1 kilogram	\$2.70
500 grams	\$1.35

Plot the weight and price for the two bunches of bananas on the graph below. Draw a line through the points and continue the line to the edges of the graph in each direction.



Explain how the line could be used to find the price of a bunch of bananas that weighs 1.2 kilograms.

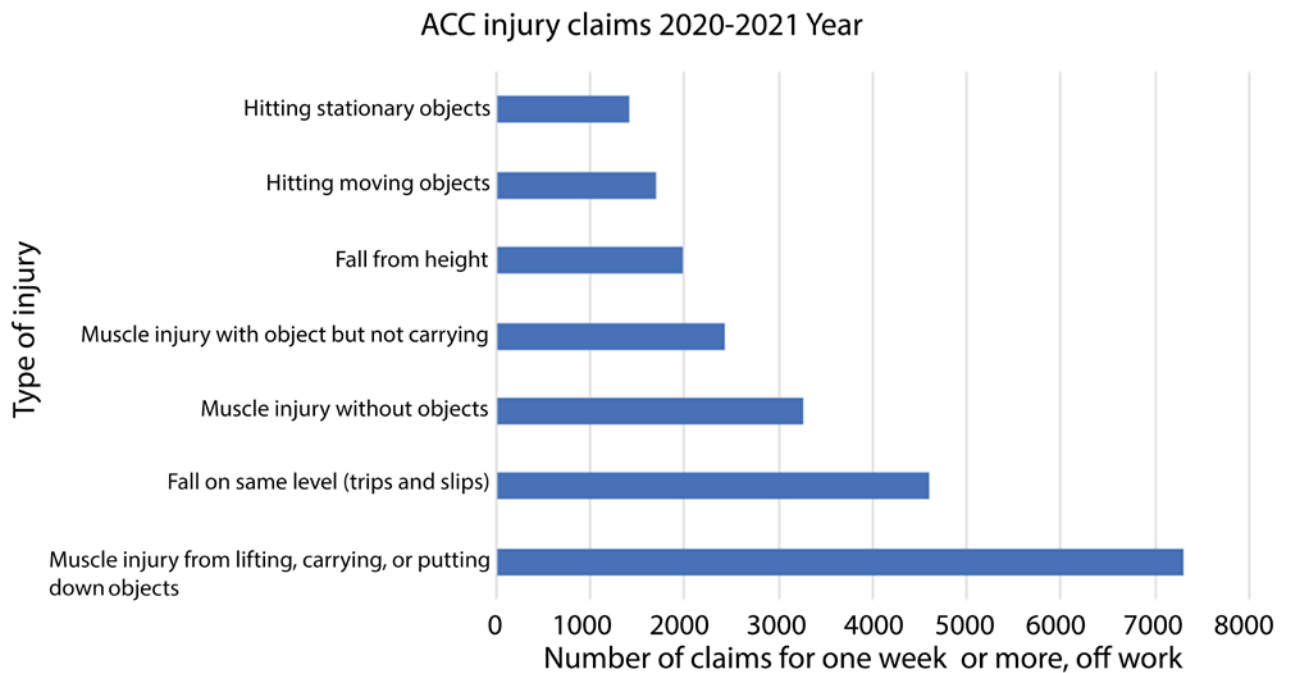
QUESTION EIGHT: Accidents in the workplace

When someone has an accident at work, they are supported by the Accident Compensation Commission (ACC). During 2021, injuries at work cost ACC a total of \$924,020,378 in claims. There are about 2,750,000 workers in New Zealand.

(a) On average, about how much money is claimed per worker?

- \$3.50
- \$35.00
- \$350.00
- \$3,500.00

(b) This graph shows the number of ACC claims where people had to stay away for one week or more, from work. It also shows the types of injury.



Select the statements which are true (more than one statement can be true):

- most injuries are strains and tears to muscles.
- more injuries come from falling over on a flat surface than falling from height.
- getting hit by objects is the most common cause of injury.
- car accidents are a major type of injury in the workplace.
- over 3000 claims were the result of muscle injury without objects.

- (c) Carla wonders if some types of work are more dangerous than others. She finds this graph.



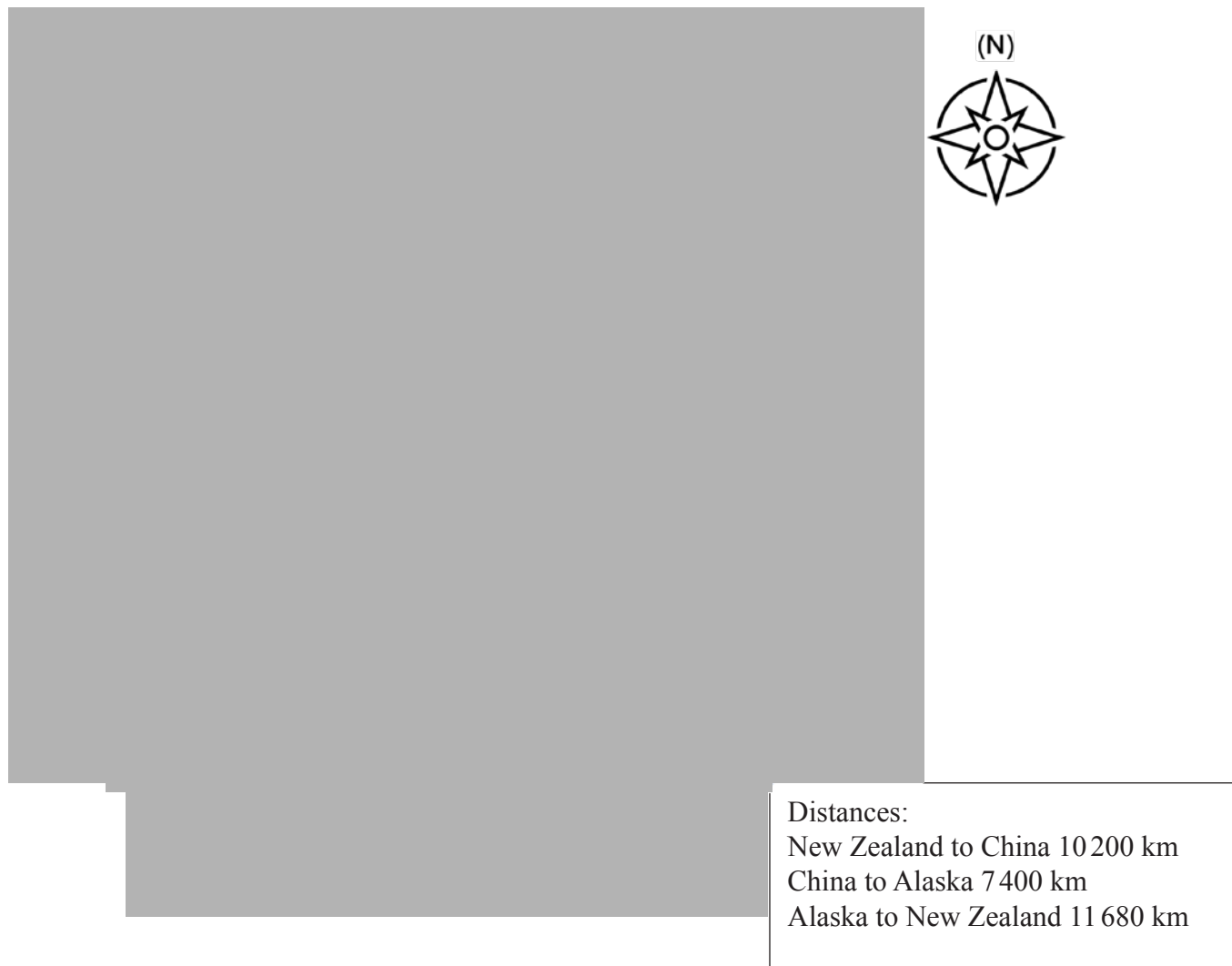
Carla's dad works on a mussel farm. Each day he lifts ropes loaded with shellfish, and full bins, on and off the boats. Carla claims "Aquaculture has a high rate of injury because workers move heavy objects."

Does Carla's claim make sense? Explain your answer using information from the graphs in both (b) and (c).

QUESTION NINE: Kūaka/bar-tailed godwits

Māori regard kūaka (bar-tailed godwits) as birds of mystery. That is because it is believed that kūaka travel through the ancestral home of Hawaiki. They migrate between New Zealand and Alaska each year as shown on the map below.

Kūaka make a non-stop flight from Alaska to arrive in New Zealand in September.



- (a) Papua New Guinea is the second of the ‘stopover sites’. It is marked by the purple spot on the map. In which direction is the flight path from New Zealand to the stopover site in Papua New Guinea.

- North
- West
- North-east
- North-west

- (b) In 2007, scientists attached a tracking device on a single kūaka, that they nicknamed E7. The map above shows the distances E7 flew as she migrated.

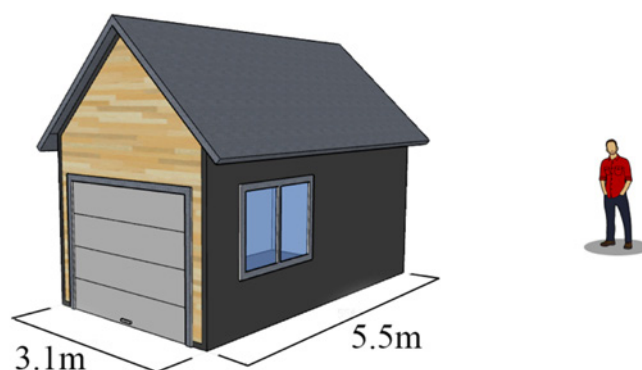
What was the total length of E7’s round trip journey?

_____ km

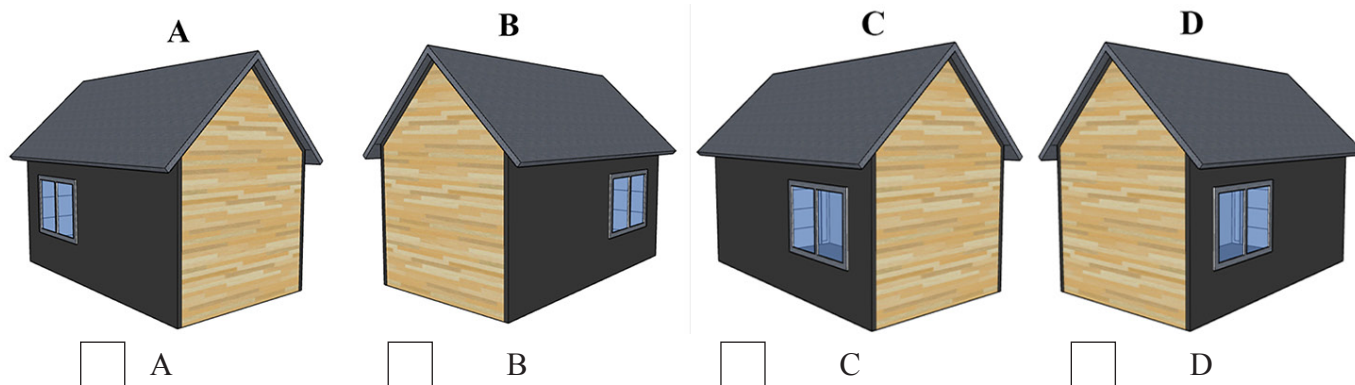
- (c) In 2020, another kākā flew non-stop for 12 200 km from Alaska to New Zealand in 11 days. Explain how to calculate this bird's average speed, in kilometres per hour, for that flight.

QUESTION TEN: Sleepout

Charlie's garage has one window and a front door.
The garage is 3.1 metres wide and 5.5 m long.



(a) Which of the diagrams below shows the garage viewed from where Charlie is standing?



(b) Charlie wants to change the garage into a sleepout. He covers the floor with carpet tiles. Charlie finds some carpet tiles online.

Each tile measures 500 mm by 500 mm and they come in packs of 15 tiles. How many packs will Charlie need?

_____ packs

- (c) Charlie's sleepout also needs a heat pump. The walls are 2.4 metres high, and the room will be insulated. A general rule for the heat pump output needed is given by this formula:

$$\text{output needed (kW)} = 0.12 \times \text{area of the room (m}^2\text{)}$$

Charlie also finds the following information online:

Area of the room	Heat pump output
10 m ²	1.5 kW
15 m ²	1.8 kW
20 m ²	2.2 kW
25 m ²	2.7 kW
30 m ²	3.2 kW
35 m ²	3.8 kW
40 m ²	4.3 kW
45 m ²	4.9 kW

Which heat pump output is best for Charlie to buy?

Explain your answer using information from both the formula and the table.

Acknowledgements

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

Question One

<https://samoamarket.com/collections/farmer-joe-vouchers?page=3>

Question Two

<https://www.thecakemixer.co.nz/products/belgian-white-chocolate-buttons-250gm>

<https://samoa.eatthekiwi.com/products/sv-white-compound-buttons-1kg>

Question Five

<https://www.thecoast.net.nz/news/zoi-sadowski-synnott-has-won-new-zealands-first-medal-at-the-beijing-winter-olympics/>

<https://www.youtube.com/watch?v=fAdPtnqdEc>

<https://news.cgtn.com/news/2021-11-15/Big-Air-Shougang-to-be-kept-as-permanent-facility-after-Beijing-2022-15cWe5wPSRa/index.html>

Question Nine

<https://www.sciencelearn.org.nz/resources/316-tracking-e7>