To be completed by candidate

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

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SUPERVISOR'S USE ONLY

32406 TERM 2

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). 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.

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QUESTION ONE: Mahi (Work)

Mei works at a cafe.

For each day Mei works, the cafe gives her $10 for travel.

Mei works 8 hours a day.

She is paid $22.70 per hour.

(a) Show how you would calculate Mei's pay for one day.

Cafe worker

Kyle delivers community newspapers.

Kyle is paid $27.30 to deliver all his newspapers.

This takes him 90 minutes.

(b) How much is Kyle paid per hour?

$ _____ per hour

Kyle delivering newspapers

Kate mows lawns.

Kate's container holds 5 litres of petrol.

It is already ¼ full.

(c) Petrol costs $2.76 per litre.

How much will it cost Kate to fill the rest of the container with petrol?

$ _____

Petrol container

A careers website shows the most common job searches in 2022.

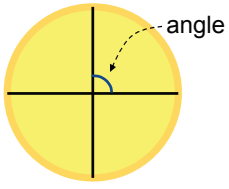
(d) Look at the graph above.

In total, about how many searches were made for "Nurse" and "Paramedic"?

_____ searches

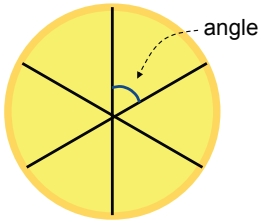
Lilly cuts pizzas so that each pizza has slices of equal size.

(e) Calculate the angle that is marked on each pizza.



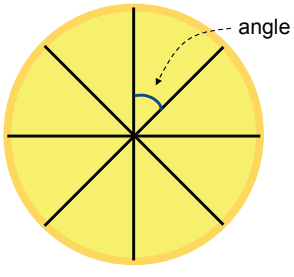
Small pizza

Angle = ☐ o



Medium pizza

Angle = ☐ o



Large pizza

Angle = ☐ o

Tui is helping her dad to build a rectangular deck. The deck will be 8 metres long and 2 metres wide.

A 1-metre-long strip of wood is called a linear metre.

Each square metre (m^2) of deck takes 11.5 linear metres of wood.

Tui says that about 190 linear metres are needed to build the deck.

Deck measuring 8 metres × 2 metres

Linear metres of decking wood

(f) Is she right? Use measurements to explain your answer.

Ingrid picks kiwifruit.

Ingrid is paid $33 for every bin she fills.

She averages 1⅓ bins per hour.

(g) How much money should Ingrid expect to make if she works for 10 hours?

$ _____

Kiwifruit bin

This graph shows the percentage of secondary school students with part-time jobs between 1973 and 2023.

(h) Is the following statement true?

The percentage of Year 13 students with part-time jobs is greater than the percentage of Year 11 students with part-time jobs.

Explain your answer using numbers from the graph.

QUESTION TWO: New Zealand birds

Here are 14 cards showing New Zealand birds.

Rock Wren | Kākāpō | Yellow-eyed Penguin | Kererū | Kea

Kōkako | Bar-tailed Godwit | Fairy Tern | Yellowhead | New Zealand Falcon

Pūkeko | Kākāriki | Kiwi | Saddleback

One card will be chosen without looking.

(a) What is the probability that the chosen bird has a name starting with **K**?

Use a percentage, decimal, or fraction: _____

The pīwauwau (rock wren) is a tiny bird that weighs about the same as one biscuit.

A packet of 10 biscuits weighs 200 grams.

(b) Select (✓) which operation gives the weight of one pīwauwau, in grams.

- ☐ 200 × 10
- ☐ 2022 ÷ 10
- ☐ 10 ÷ 200
- ☐ 200 ÷ 10
- ☐ 200 – 10

In 1998 there were about 100,000 kiwi living in New Zealand.
In 2023 there are about 68,000 kiwi left.

(c) By what percentage have the kiwi numbers gone down between 1998 and 2023?

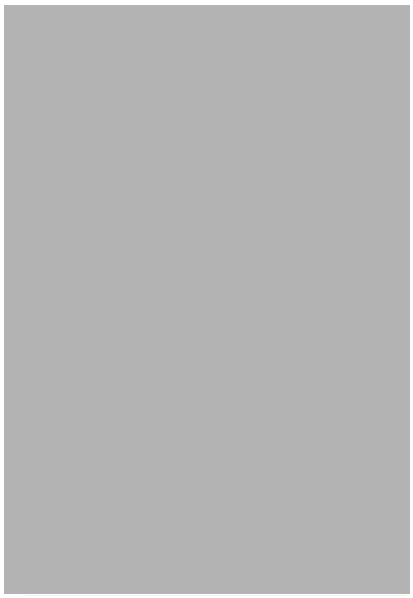
_____ %

Kiwi

The moa is an extinct bird.

A large moa weighed about 230 kilograms.

A large kiwi weighs about 3,300 grams.



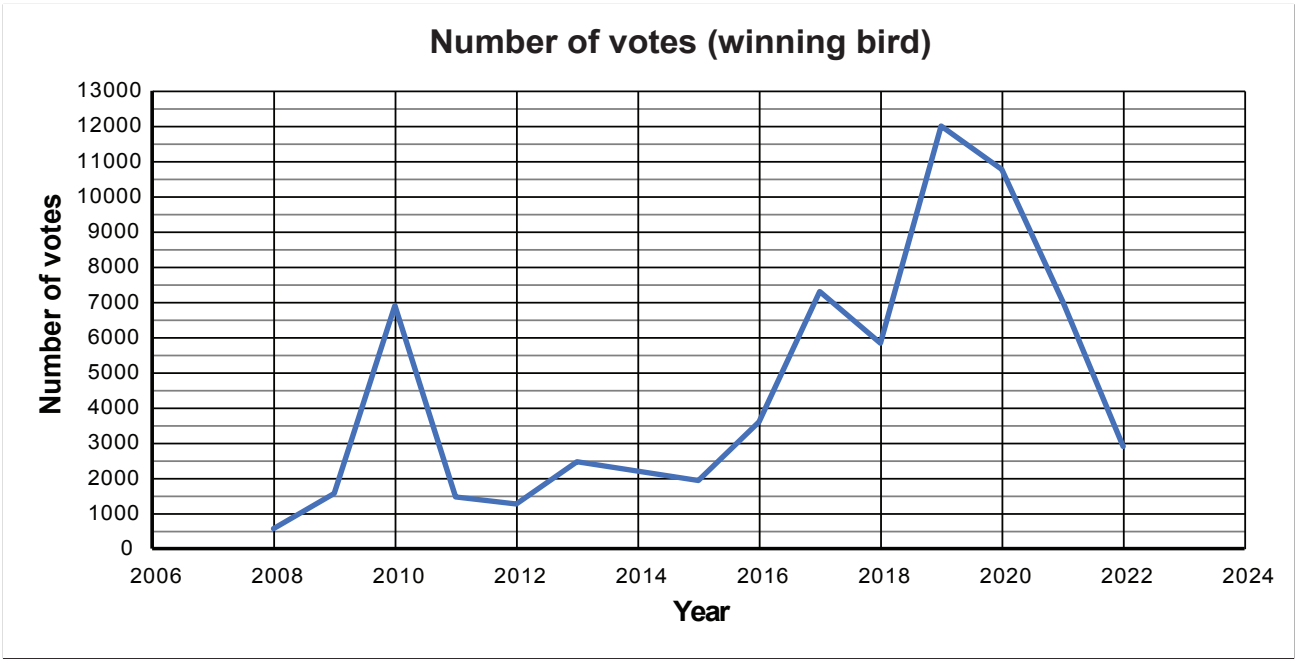
Moa and kiwi

(d) About how many times heavier was a moa than a kiwi?

_____ times heavier

Every year, *Forest & Bird* holds a competition where people vote for *Bird of the Year*.

This graph shows the number of votes for the winning bird since 2008.



(e) About how many votes did the winning bird get in 2017?

_____ votes

Look at this graph of kākāpō numbers over time.

Someone has claimed that the number of kākāpō in 2022 is four times the number of kākāpō in 1994.

(f) Do you agree?

Explain your answer using numbers from the graph.

The movement of Cheeky, the kea, was tracked for one day.

This map shows where Cheeky went.

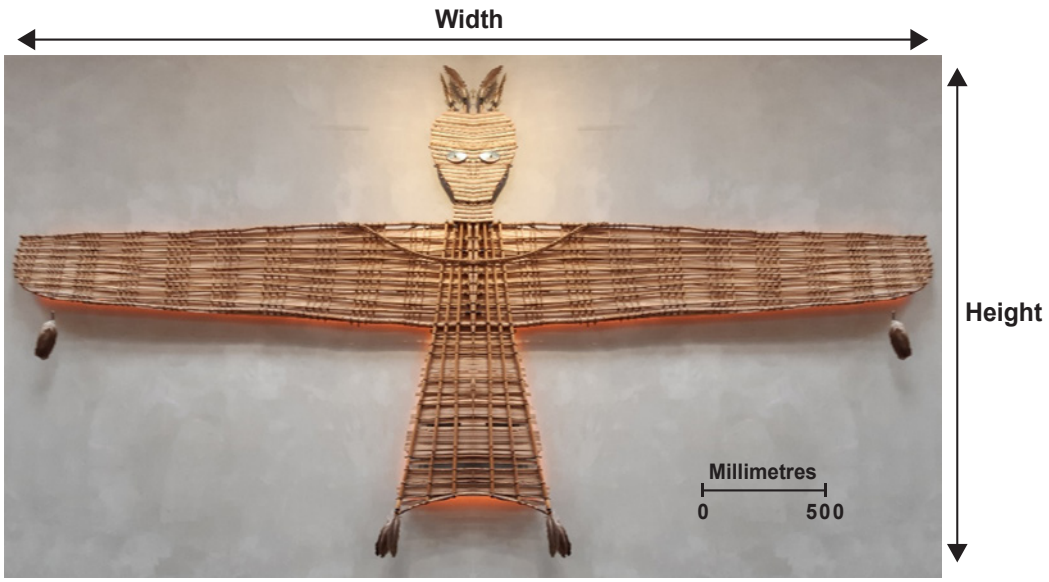
Cheeky's flight path Cheeky the kea

(g) Select (✓) which answer is closest to the total distance that Cheeky flew.

- ☐ 700 m
- ☐ 7,000 m
- ☐ 70,000 m
- ☐ 70 km
- ☐ 70,000 cm

QUESTION THREE: Manu tukutuku

This is a manu tukutuku, a traditional Māori kite.



(a) The width of the manu tukutuku is 3,660 mm.

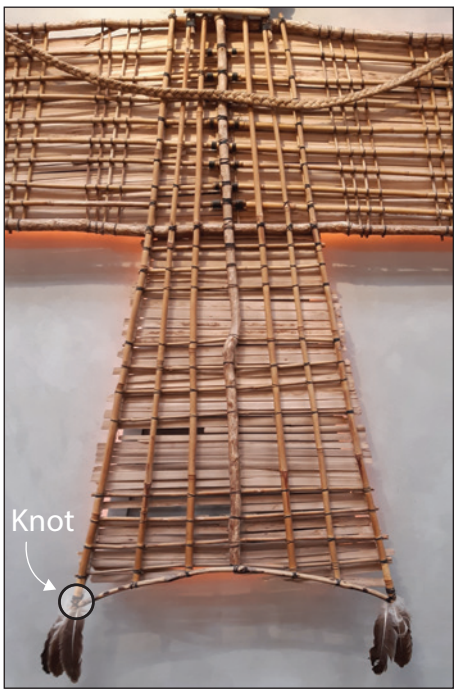
Estimate the height of the manu tukutuku.

Height = _____ mm

The body of the manu tukutuku has knots where sticks cross.

One knot is circled in this photo.

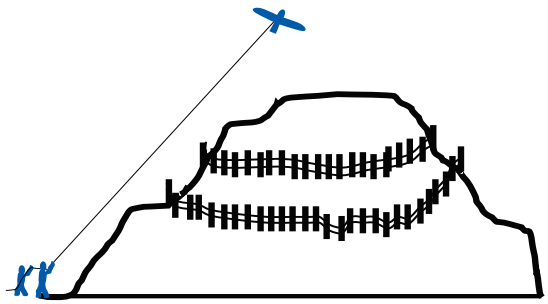
The body of the manu tukutuku has 22 sticks running horizontally (across) and 7 sticks running vertically (up).



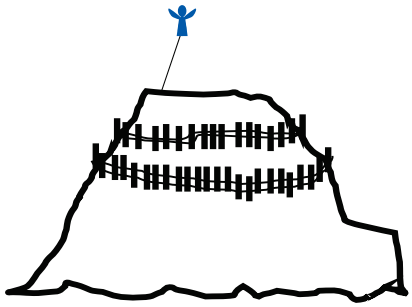
(b) Show how you would work out the total number of knots in the body of the manu tukutuku.

Manu tukutuku were often flown above a pā to mark the beginning of Matariki.

Here are two views of a manu tukutuku flying over a pā. One view is from the south, one view is from the east.

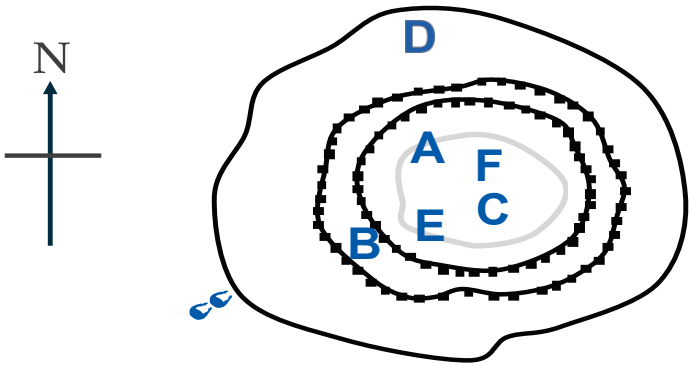


View from south



View from east

(c) Here is the view from above the pā.



View from above

Use the south and east views to work out which letter best shows the position of the manu tukutuku in the view from above.

Select (✓) the letter: ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F

QUESTION FOUR: Garden

The picture shows an octagon-shaped garden frame.

All sides are the same length.

The perimeter of the frame measures 6 metres.

Note: Perimeter is the total distance around the outside of a shape.

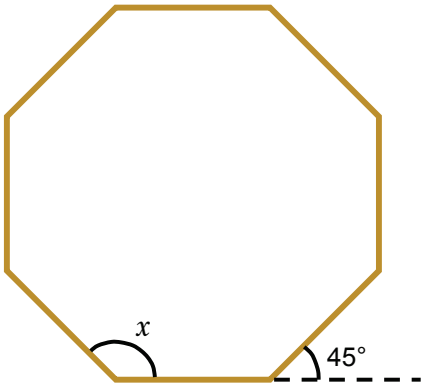
Octagon-shaped garden frame

(a) What is the length of **ONE** side?

_____ metres

In the garden frame, all the internal angles (like x) are equal.

Each external (outside) angle measures 45°.

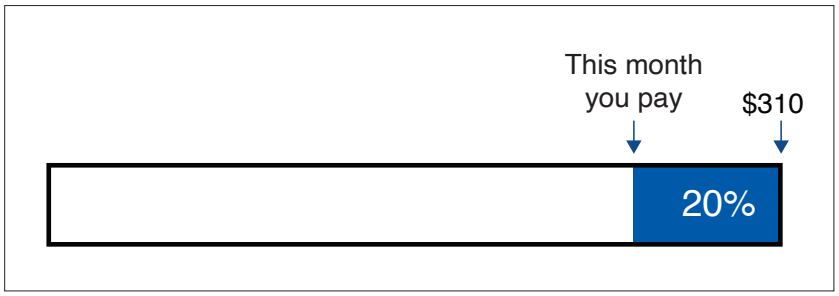


(b) How many degrees does each internal angle measure?

_____ °

The usual price of the octagon-shaped garden frame is $310.

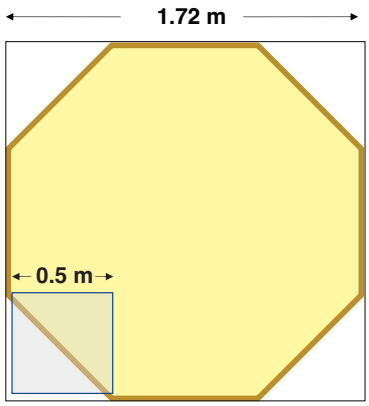
This month you get 20% off the usual price.



(c) What is the price of the octagon-shaped garden frame this month?

$ _____

Rob, the gardener, says that he can find the inside area of this octagon using these calculations:



$1.72 \times 1.72 = 2.96$ m^2 (rounded)

$2 \times (0.5 \times 0.5) = 0.5$ m^2

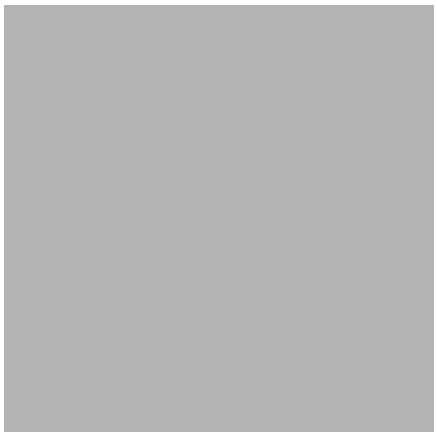
Area of octagon = $2.96 - 0.5 = 2.46$ m^2

(d) Explain how Rob is using the information in the diagram to get his answer.

Rob wants to fill the garden frame with topsoil.

The topsoil comes in bags that hold 25 litres.

He works out that the volume of the frame is 0.8 m^3. Rob also knows that 1 cubic metre (m^3) is the same as 1000 litres (L).



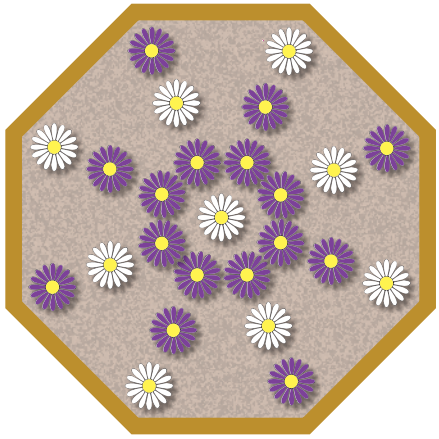
Garden frame with topsoil

(e) How many bags of topsoil does Rob need to fill the octagon-shaped garden frame?

_____ × 25 litre bags

Rob plants flowers.

The ratio of white to purple flowers is meant to be 2:3.



Rob's garden

(f) Has he planted his garden correctly?
Explain your answer using the number of white and purple flowers.

QUESTION FIVE: *Treat Week*

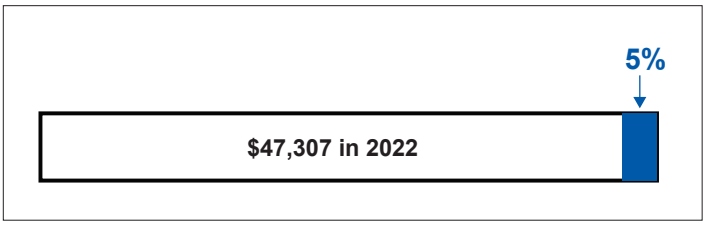
The *SPCA* runs annual *Treat Week* fundraisers. People make treats, such as cupcakes, to raise money to protect animals in New Zealand.

In 2022, there were 206 *Treat Week* fundraisers. A total of $47,307 was raised.

(a) On average, how much money did each fundraiser make?

$ _____

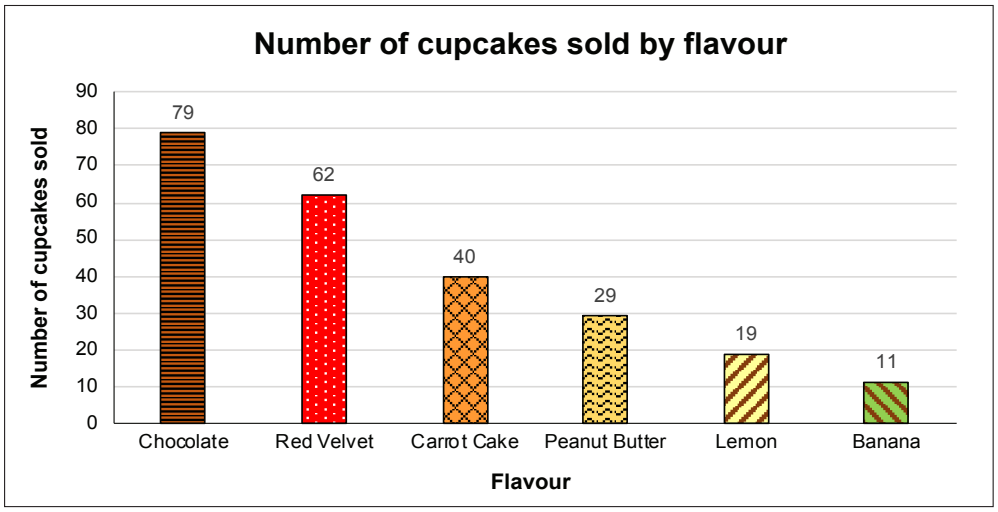
In 2023, the *SPCA* hopes to increase the amount of $47,307 raised in 2022 by 5%.



(b) What is the total amount the *SPCA* hope to fundraise during *Treat Week* 2023?

$ _____

Here is a graph of cupcake sales at a school for *Treat Week* 2022. In total, 240 cupcakes were sold.



(c) Is the following statement true?

About one third of sales were chocolate-flavoured cupcakes.

Explain your answer using numbers from the graph.

Remy bakes cupcakes to sell for *Treat Week*.

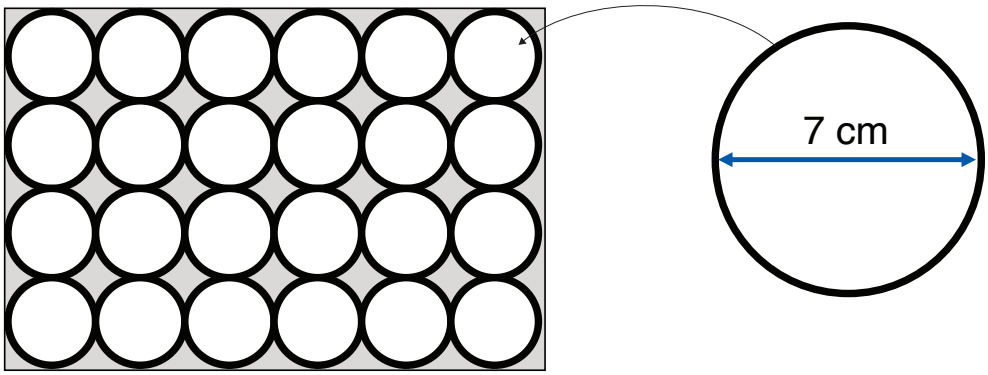
Remy buys these ingredients to bake 24 lemon cupcakes:

Cupcake ingredients	Cost of ingredients
Cupcake mix	$12.40
500 g butter	$5.40
1 L milk	$2.59
½ dozen eggs	$3.90
2 lemons	$1.69
Cupcake decoration pack	$6.59
24 cupcake baking cups	$2.00

(d) What is the cost of the ingredients for one cupcake?

$ _____

Remy takes 24 cupcakes to school in the rectangular carry tray shown below.



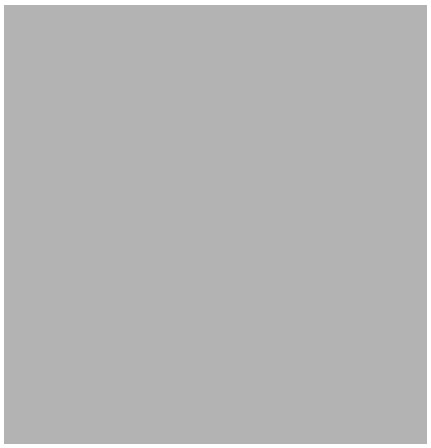
The top of each cupcake is a circle that measures 7 cm across.

(e) What are the length and width of Remy's tray?

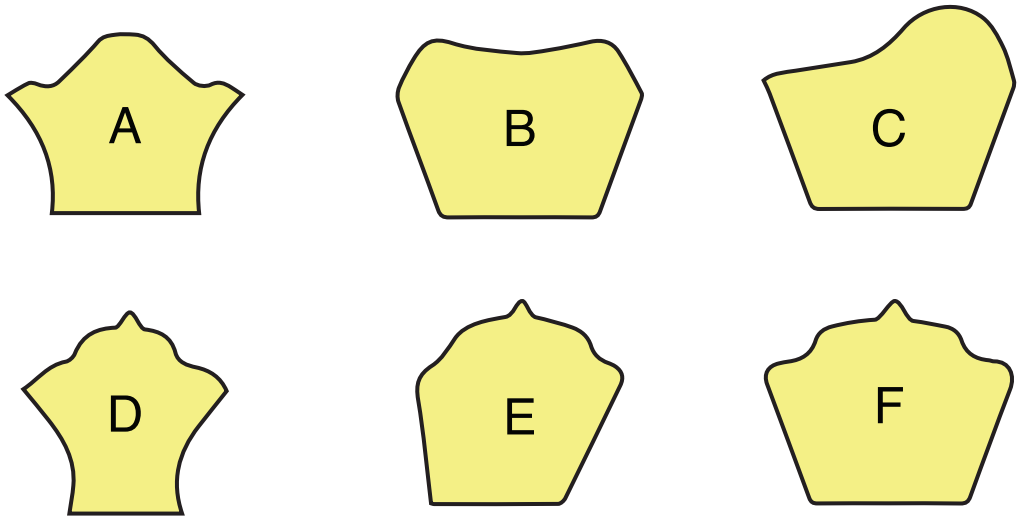
Length = _____ cm

Width = _____ cm

Remy takes a photograph of a cupcake.



(f) Which image most closely matches the side view of the cupcake?



Write the letter of the image here: _____

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 1
Cafe worker, https:/ /www.pexels.com/photo/anonymous-person-preparing-coffee-to-client-in-cafe-4349766/
Kyle delivering newspapers, https://teens.lovetoknow.com/Jobs_for_Teens_13_and_Up
Petrol container, https://www.hgtv.com/lifestyle/clean-and-organize/safe-gasoline-storage-and-use
Kiwifruit bin, https://tumutimbers.co.nz/assets/Images/Photo-Galleries/KIWI-FRUIT-BIN.png

Question 2
Rock Wren, https://www.birdoftheyear.org.nz/
Kākāpō, https://www.birdoftheyear.org.nz/past-champions
Yellow-eyed penguin, https://www.birdoftheyear.org.nz/
Kererū, https://www.birdoftheyear.org.nz/
Kea, https://www.birdoftheyear.org.nz/
Kōkako, https://www.birdoftheyear.org.nz/
Bar-tailed Godwit, https://www.birdoftheyear.org.nz/
Fairy Tern, https://www.birdoftheyear.org.nz/
Yellowhead, https://www.birdoftheyear.org.nz/
New Zealand Falcon, https://www.birdoftheyear.org.nz/
Pūkeko, https://www.birdoftheyear.org.nz/
Kākāriki, https://www.birdoftheyear.org.nz/
Kiwi, https://www.birdoftheyear.org.nz/
Saddleback, https://cdn.download.ams.birds.cornell.edu/api/v1/asset/110235411/1800
Pīwauwau, https://www.birdoftheyear.org.nz/
Mallowpuffs packet, https://www.countdown.co.nz/shop/productdetails?stockcode=271145&name=griffins-mallowpuffs-chocolate-biscuits-original
Kiwi, https://www.wayfaringkiwi.com/wp-content/uploads/2020/12/where-to-see-kiwi-birds-in-new-zealand.jpg
Moa, https://cdn.britannica.com/40/201340-050-6510857E/South-Island-giant-moa-female-Dinornis-robustus.jpg
Kiwi (small), https://b2640405.smushcdn.com/2640405/wp-content/uploads/2021/12/smaller-kiwi.png?lossy=1&strip=1&webp=1
Flight distance map, https://goo.gl/maps/ZbmfPc93Xt1twBrS9
Cheeky, https://i.pinimg.com/originals/7d/d4/3c/7dd43cb68fe2c8023dd07294a8775429.jpg

Question 4
Octagonal garden frame, https://i.etsystatic.com/9973995/r/il/246ff0/2231501363/il_794xN.2231501363_d75y.jpg
Frame filled with soil, https://i.etsystatic.com/iap/a621bb/3641983566/iap_640x640.3641983566_qqfb46l5.jpg

Question 5
SPCA Treat Week banner, https://www.facebook.com/RoyalNZSPCA/photos/a.10150683912059438/10160009257239438/
Lemon cupcake, https://www.biggerbolderbaking.com/wp-content/uploads/2022/03/Lemon-Cupcakes1-500x500.jpg

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