

— Public use —

Given name/s

Family name

Teacher

Class

School name

Sample common internal assessment 2020

Question and response book

Essential Mathematics

Time allowed

- Perusal time — 5 minutes
- Working time — 60 minutes

General instructions

- Answer all questions in this question and response book.
- Write using black or blue pen.
- QCAA formula sheet provided.
- Ruler required.
- Calculator allowed.

Part A: simple (40 marks)

- 9 short response questions

Part B: complex (10 marks)

- 2 short response questions



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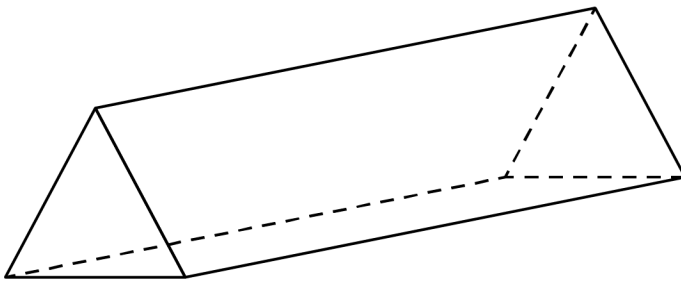
Part A: simple

Instructions

- Questions worth more than one mark require mathematical reasoning and/or working to be shown to support answers.
 - If you need more space for a response, use the additional pages at the back of this book.
 - On the additional pages, write the question number you are responding to.
 - Cancel any incorrect response by ruling a single diagonal line through your work.
 - Write the page number of your alternative/additional response, i.e. See page ...
 - If you do not do this, your original response will be marked.
 - Part A has nine questions and is worth 40 marks.
-

QUESTION 1 (2 marks)

A chocolate company has decided to use the three-dimensional shape below for their packaging.



Not drawn to scale

- a) Identify the name of this three-dimensional shape.

[1 mark]

- b) How many edges does the packaging have?

[1 mark]

QUESTION 2 (4 marks)

A landscaper is planning to build a vegetable garden in a backyard. Timber will be used to surround the rectangular vegetable garden as shown below.



Not drawn to scale

- a) Calculate the perimeter of the vegetable garden in metres (m).

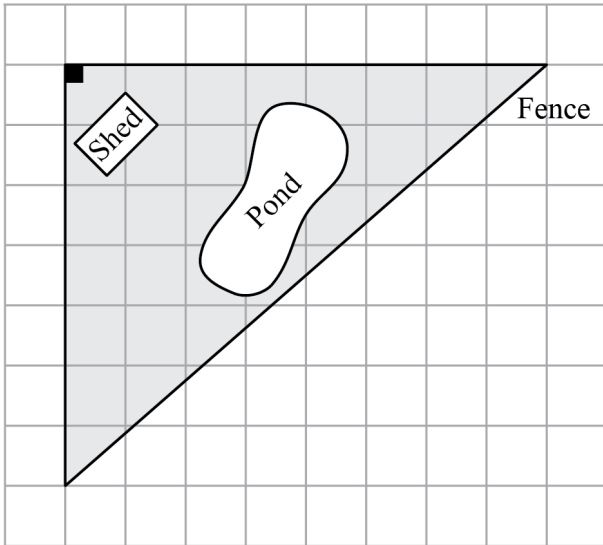
[2 marks]


- b) The landscaper has 11 metres (m) of timber. Determine the amount of timber left over from building the vegetable garden. Give your answer in centimetres (cm).

[2 marks]

QUESTION 3 (3 marks)

A farmer wants to build a fence to create a triangular-shaped enclosure for some animals. A map of the relevant block of land is shown below. The shaded area in the map represents the animal enclosure.



 = 1 m²

a) Estimate the area of the pond.

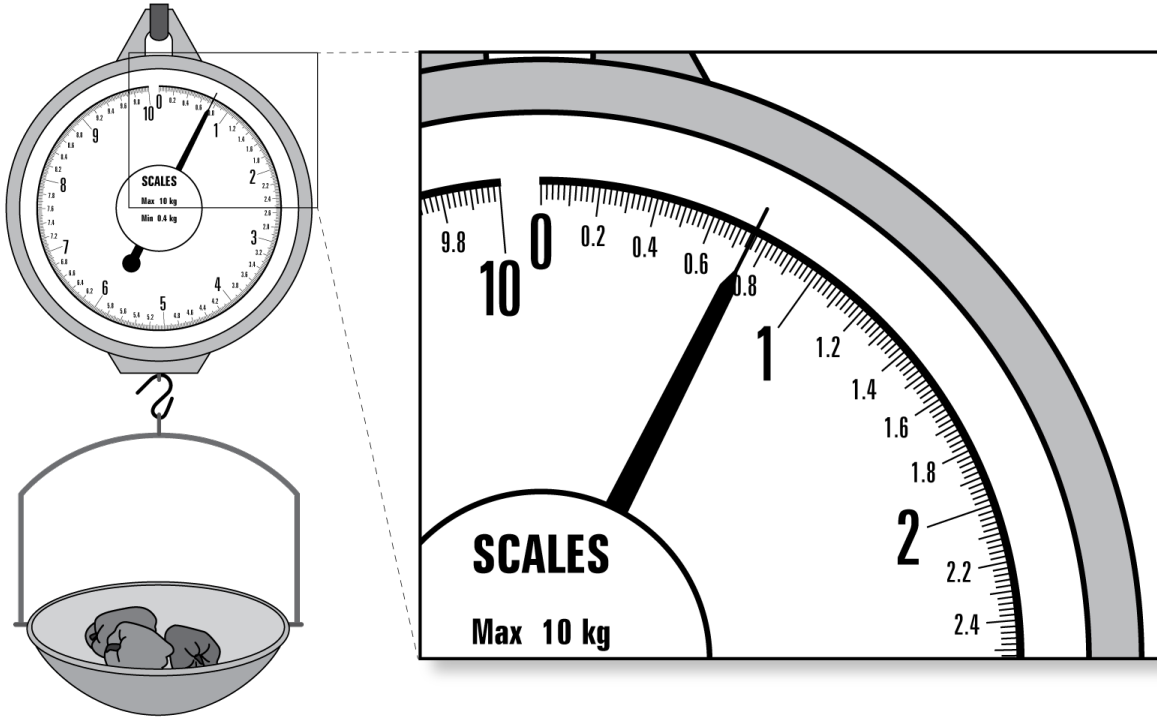
[1 mark]

b) Determine the total area of the animal enclosure (including the shed and pond) in square metres (m²).

[2 marks]

QUESTION 4 (6 marks)

Consider the following images of a weighing scale.



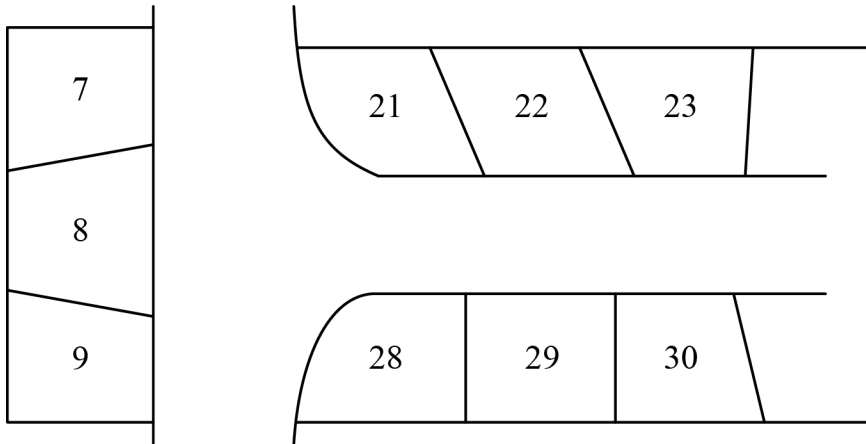
- a) Estimate the mass of the three capsicums shown on the scales in grams (g). *[1 mark]*

- b) Use leading-digit approximation to estimate the mass of nine capsicums in grams (g). *[2 marks]*

- c) Use the result from 4b) to calculate the cost, in dollars (\$), of buying nine capsicums if they are sold for \$6.40 per kilogram. *[3 marks]*

QUESTION 5 (4 marks)

The diagram below shows some blocks of land in a new subdivision. Each block is numbered for identification purposes.



Scale 1:1600

Calculate the perimeter of block 22 to the nearest 10 metres (m).

QUESTION 6 (5 marks)

A painter uses a ladder to access a window frame on the outside wall of a building. The ladder reaches the base of the frame, which is 4.5 metres (m) above the ground. The bottom of the ladder is 1.5 metres (m) from the wall.

a) Represent this situation using a sketch.

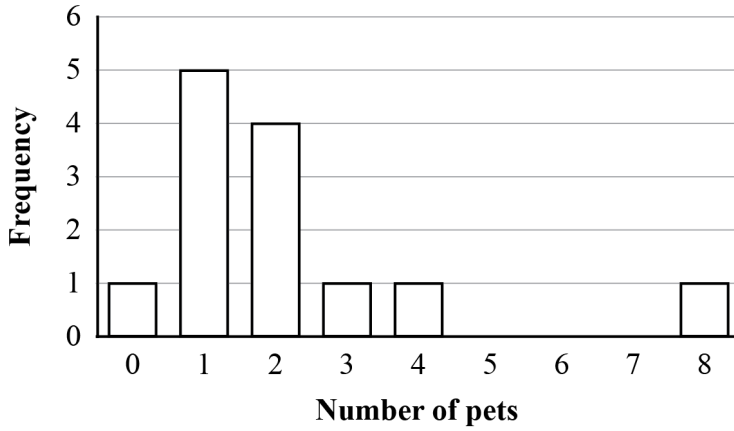
[2 marks]

b) Calculate the length of the ladder.

[3 marks]

QUESTION 7 (6 marks)

A group of 13 students is surveyed about how many pets they own. The results are displayed in the graph below.



a) Identify the modal number of pets. *[1 mark]*

b) List the 13 survey results. *[1 mark]*

c) Calculate the mean number of pets. *[2 marks]*

d) Identify the median number of pets. *[1 mark]*

e) Describe the spread of the data. *[1 mark]*

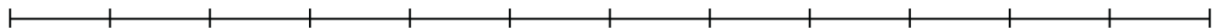
QUESTION 8 (5 marks)

A student received pocket money each week as listed below.

\$10, \$0, \$10, \$10, \$50, \$20, \$5, \$20, \$15

Construct a box plot for this data using the five-number summary.

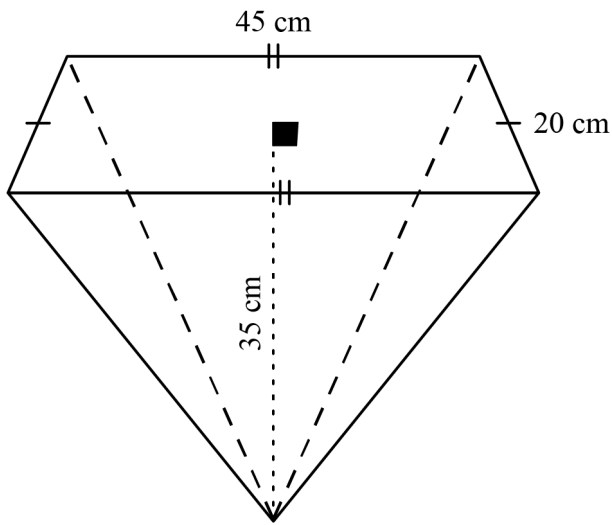
Draw box plot here.



Note: If you make a mistake in the graph, cancel it by ruling a single diagonal line through your work and use the additional graph on page 16 of this question and response book.

QUESTION 9 (5 marks)

A commercial cupcake factory uses a right pyramid to ice cupcakes. The right pyramid is filled with icing.



Not drawn to scale

- a) Calculate the volume of the pyramid in cubic centimetres (cm^3).

[3 marks]

- b) Use your answer from 9a) to determine the capacity of the pyramid to the nearest litre (L).

[2 marks]

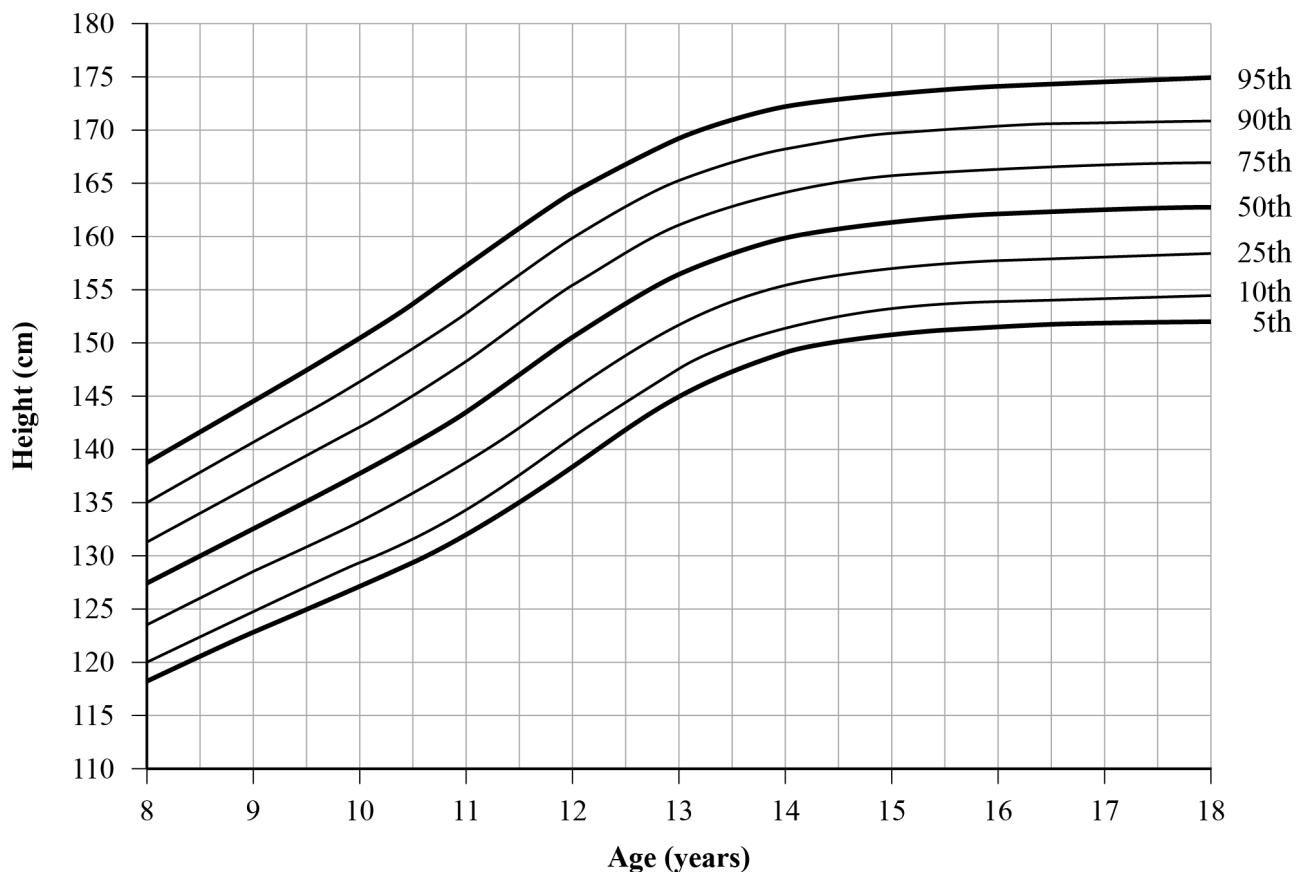
Part B: complex

Instructions

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- Part B has two questions and is worth 10 marks.

QUESTION 10 (5 marks)

Use the height-for-age percentile chart for girls (8 to 18 years), shown below, to answer this question.



Alex is 10 years old and is in the 10th percentile for her height.

a) How tall is she?

[1 mark]

b) Given Alex remains in the 10th percentile for her height, determine her age when she is 5 centimetres (cm) taller than in 10a).

[1 mark]

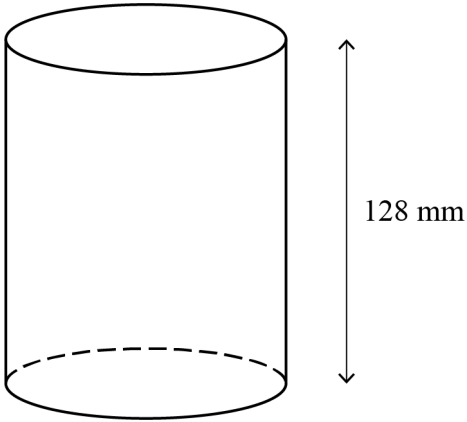
Alex's parents buy her a bike for her 10th birthday. They assume the size of the bike will be suitable for her until her 15th birthday. The maximum recommended height for a person to ride this bike is 150 centimetres (cm).

c) Given Alex remains in the 10th percentile for her height, explain if this assumption is reasonable.

[3 marks]

QUESTION 11 (5 marks)

The maximum length of a rod that can be placed diagonally inside the closed cylindrical cardboard package shown below is 16 centimetres (cm).



Not drawn to scale

The cardboard used to manufacture the package costs \$50 per square metre. Is a price of \$3 to buy this package reasonable?

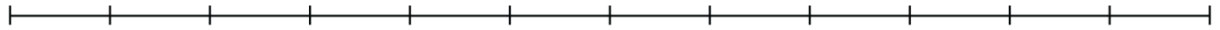
ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

ADDITIONAL RESPONSE SPACE FOR QUESTION 8

If you want this graph to be marked, rule a diagonal line through the graph on page 8.

Draw box plot here.



References

Question 10

Derived from Centers for Disease Control and Prevention 2000, *2 to 20 years: Girls — Stature-for-age and weight-for-age percentiles* in 'Clinical growth charts', www.cdc.gov/growthcharts/clinical_charts.htm.

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