CANDIDATE
NAME

CENTRE
NUMBER

CANDIDATE
NUMBER

MATHEMATICS **1112/02**

Paper 2 **April 2016**

1 hour

Candidates answer on the Question Paper.

Additional Materials: Calculator
Geometrical instruments
Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, glue or correction fluid.

DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Calculator allowed.

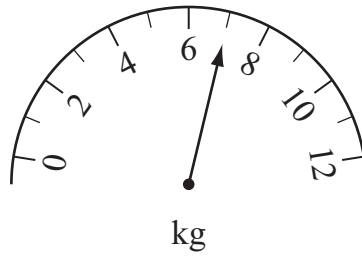You should show all your working in the booklet.

The number of marks is given in brackets [ ] at the end of each question or part question.

The total number of marks for this paper is 50.

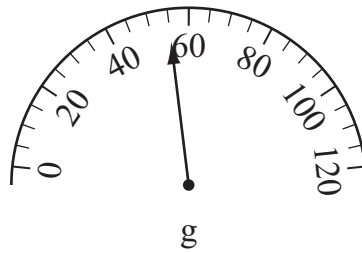This document consists of **15** printed pages and **1** blank page.

CAMBRIDGE
International Examinations

[Turn over

1 Write the mass shown on each scale.

(a)

kg

.... kg   [1]

(b)

g

.... g   [1]

2 Write these measurements in order, from smallest to largest.

30 cm   0.35 m   320 mm   28 cm

....
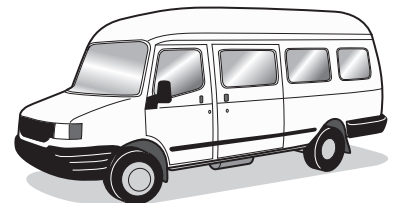
smallest   largest

[1]

3 There are 149 students in Hussein's school.
A minibus can seat 16 students.

How many minibuses are needed to seat all the students?

.... minibuses   [1]

4 Sam measures the lengths of lizards found living in two different areas.
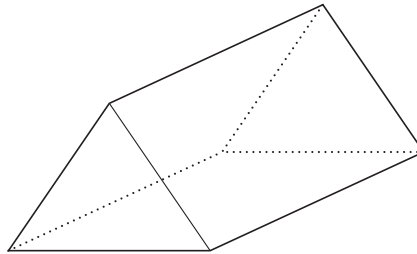The table shows his results.

	Mean	**Range**
Area 1	16.4 cm	5.5 cm
Area 2	13.7 cm	6.8 cm

Tick (✓) to show which box matches each statement.

	True	False	Cannot tell
Area 2 has longer lizards on average.	☐	☐	☐
The lengths of lizards in Area 1 are less varied.	☐	☐	☐
The longest of all the lizards found comes from Area 1	☐	☐	☐

[2]

5 A triangular prism has 6 vertices, 5 faces and 9 edges.

A **different prism** has 12 vertices.

Find the number of edges.

.... edges [1]

 [Turn over

6 Nima takes the bus to work each morning.
Nima is planning an investigation to see how many passengers use her bus each day.
She designs this frequency table to record her data.

Number of passengers	Tally
1 to 8	
9 to 16	
17 to	
.... to	

Complete the **first column** so that the intervals have equal class widths. [2]

7 Kendra has b birds, c cats and r rabbits.

(a) The number of birds and cats are connected by the equation $c = b + 3$

Tick (✓) the true statement.

Kendra has 3 more birds than cats. ☐

Kendra has 3 more cats than birds. ☐

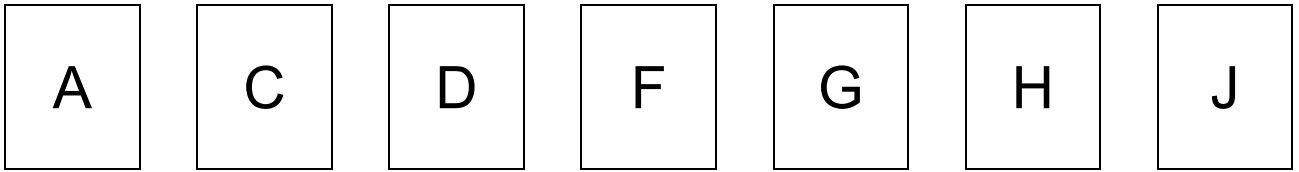Kendra has 1 cat and 3 birds. ☐

Kendra has 3 birds and 1 cat. ☐

[1]

(b) Kendra has twice as many rabbits as birds.

Write this information as an equation involving b and r.

.... [1]

8 Jade has seven cards.
Each card is labelled with a letter.

| A | C | D | F | G | H | J |

Jade picks one of her cards at random.

Find the probability that the card she picks is

(a) labelled F,

.... [1]

(b) labelled with a letter that is in her name, JADE,

.... [1]

(c) labelled with a letter that has **at least** one line of symmetry.

.... [1]

9 (a) Solve the equation $5x - 3 = 52$

$x =$ .... [1]

(b) Solve the equation $6n + 3 = 2n + 31$
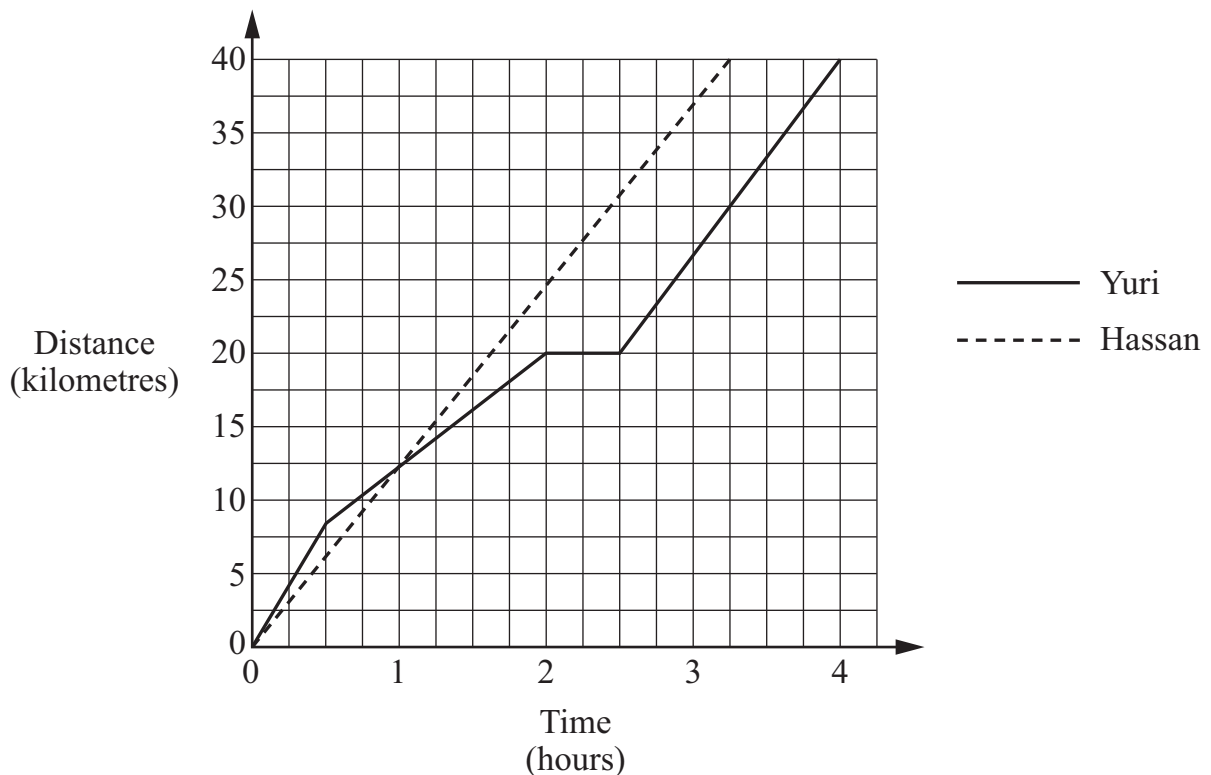
$n =$ .... [2]

6

10 A farmer has 143 hectares of land.
    62 hectares of this land is planted with vegetables.

    Calculate the percentage of the farmer's land that is planted with vegetables.
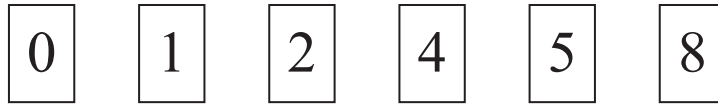
    .... %   [1]

11 Yuri and Hassan take part in a 40 kilometre race.

    Work out the difference in the number of **minutes** that Yuri and Hassan take to run the race.

    .... minutes [1]

12 Here are some number cards.

$$0 \quad 1 \quad 2 \quad 4 \quad 5 \quad 8$$

Use each card **once** to complete the equivalences.

$$\frac{\boxed{}}{4} \quad = \quad 0.\boxed{}\boxed{}$$

$$\frac{\boxed{}}{5} \quad = \quad \boxed{}\boxed{} \%$$

[2]

13 Complete the table by writing the name of a quadrilateral that has the given property.
Write the name of a **different** quadrilateral each time.

The first row has been completed for you.

Property	Name of quadrilateral
All sides equal	*Square*
Two sets of parallel sides	
Diagonals are equal in length	
Rotational symmetry of order 2	

[2]

14 Simplify

(a) $3a \times a$

.... [1]

(b) $7 - 5a + 2 + 3a$

.... [1]

15 (a) The values of x and y are directly proportional.
Complete the table by filling in the missing numbers.

x	3		30
y	96	128	

[2]

(b) Find the equation connecting x and y.

.... [1]

16 Some information about the areas of two farms is shown in the table.

Complete the table.

	Area in hectares	**Area in square metres**
Farm A	13.6	136 000
Farm B		1 965 000

[1]

17 The first five terms of a sequence are

$$7, \quad 10, \quad 13, \quad 16, \quad 19, \quad \ldots\ldots$$

(a) What is the nth term of the sequence?

.... [1]

(b) Work out the 1000th term of the sequence.

.... [1]

18 This stem-and-leaf diagram shows the ages of a football first team.

First team   Second team

					8	6	1							
			4	3	3	1	2							
		9	8	5	3	2	3							
							4							

Key

1 | 2 | 5

21 in first team

25 in second team

Here are the ages of the second team.

17   23   41   24   38   35   42   21   40   20   20
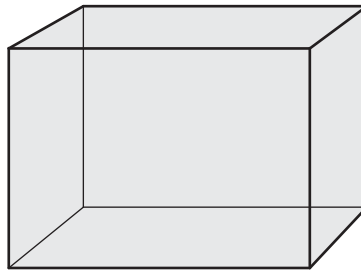
Complete the stem-and-leaf diagram. [2]

19 Here is a function $x \rightarrow x + 6$

The inverse of this function is $x \rightarrow x - 6$

Write down the inverse of the function $x \rightarrow \dfrac{x}{4}$

$x \rightarrow$ .... [1]

20 The dimensions of the inside of a fish tank are 120 cm by 60 cm by 75 cm.

Work out the volume of the space inside the tank, in **cubic metres**.

.... m^3 [2]

21 The quantities x and y are in direct proportion.
When $x = 5$, $y = 30$

Choose from these cards to complete the sentence correctly.

| increase | decrease | 7.5 | 15 | 45 | 120 |

If x increases from 5 to 20 then y will .... from 30 to ....

[1]

22 Put a ring around all the calculations that simplify to give 9^{10}

$$9^2 \times 9^7 \times 9$$

$$3^4 \times 3^6 \qquad\qquad 9^{13} \div 9^3$$

$$9^{20} \div 9^2 \qquad\qquad 9^5 \times 9^2$$

[2]

23 (a) Factorise fully

$$18 - 12e$$

.... [1]

(b) Expand and simplify

$$4c - 7(2d + c)$$

.... [2]

24 Oliver travels 180 kilometres in $2\frac{1}{4}$ hours.

Work out his average speed.
Give your answer in kilometres per hour.

.... km/h [2]

25 Three lines are drawn on a graph.
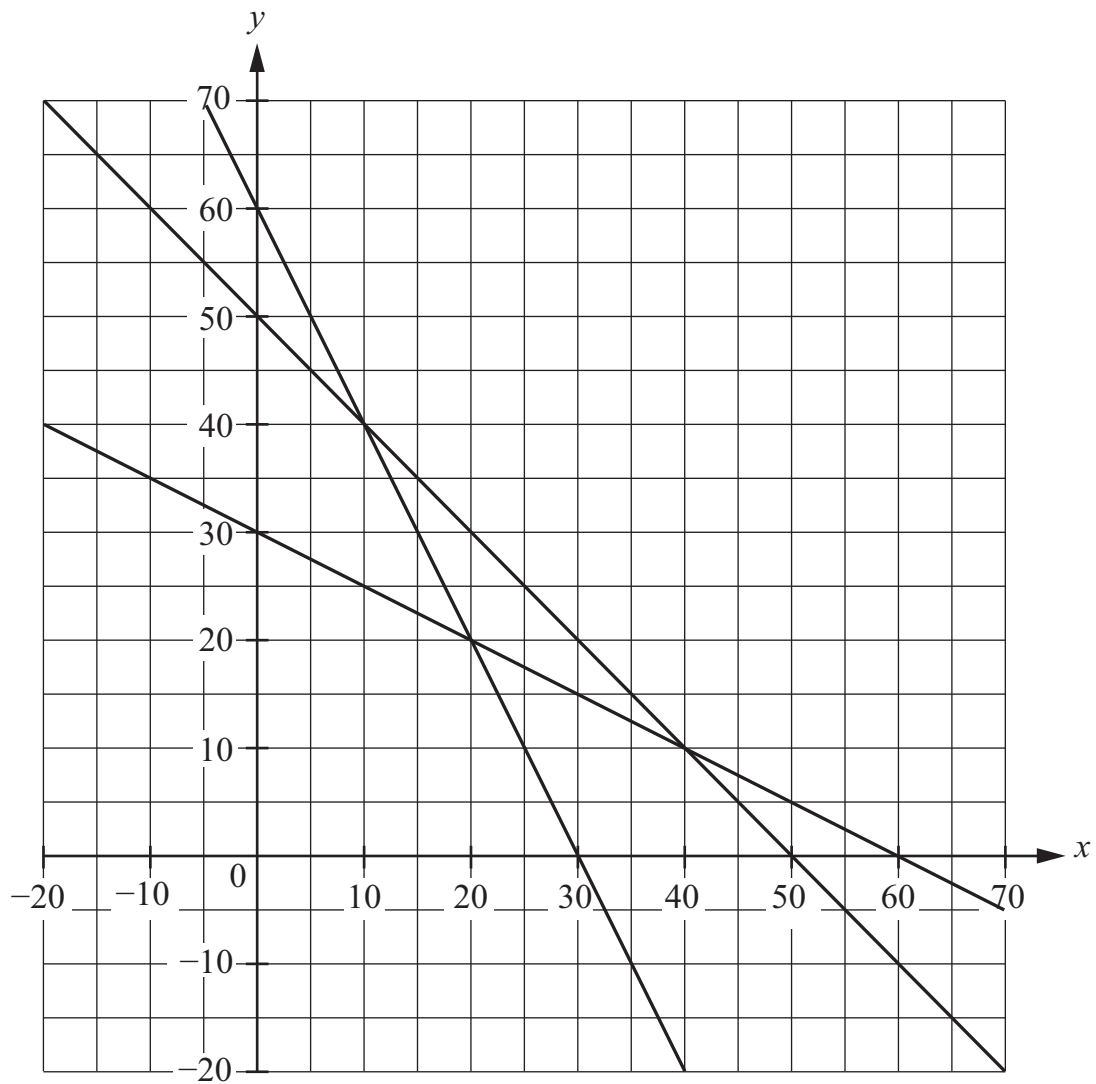
Use the graph to solve simultaneously these two equations

$$x + y = 50 \qquad \text{and} \qquad 2x + y = 60$$

$x =$ ....

$y =$ ....

[1]

26 Arrow A maps onto arrow B using a **single** transformation.
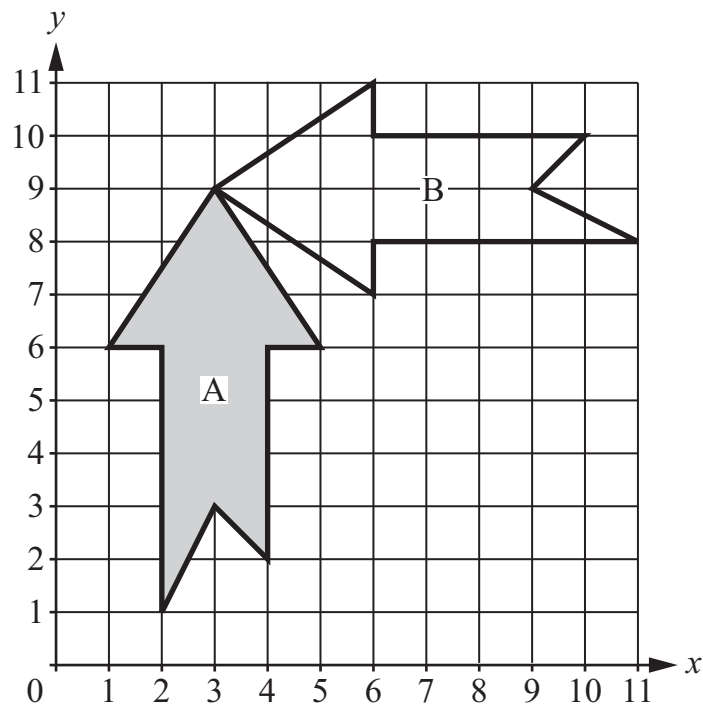
Describe this transformation fully.

....

.... [3]

27 Angelina, Lotte and Manuel all buy petrol.
They all pay the same price per litre.

Angelina buys 18.5 litres of petrol and pays $27.01
Lotte pays $40.15 for her petrol.
Manuel buys 28.3 litres of petrol.
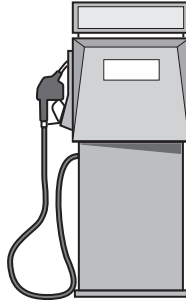
Who buys more petrol, Lotte or Manuel?

Lotte ☐   Manuel ☐

Show how you worked out your answer.

[2]

16

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