OCR

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Friday 7 November 2014 – Morning

GCSE MATHEMATICS A

A503/01 Unit C (Foundation Tier)

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
- Scientific or graphical calculator
- Geometrical instruments
- Tracing paper (optional)

Duration: 1 hour 30 minutes

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Your answers should be supported with appropriate working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

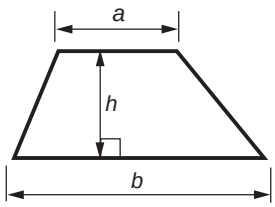
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Your quality of written communication is assessed in questions marked with an asterisk (*).
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- The total number of marks for this paper is **100**.
- This document consists of **20** pages. Any blank pages are indicated.

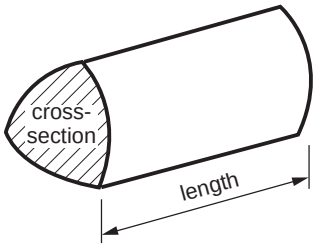
You are permitted to use a calculator for this paper

Formulae Sheet: Foundation Tier

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = (area of cross-section) × length



PLEASE DO NOT WRITE ON THIS PAGE

Answer **all** the questions.

1 **(a)** Calculate.

(i) £5.60 ÷ 7

(a)(i) £ ..... **[1]**

(ii) 2.5^3

(ii) ..... **[1]**

(iii) $\sqrt{4.41} + 7$

(iii) ..... **[1]**

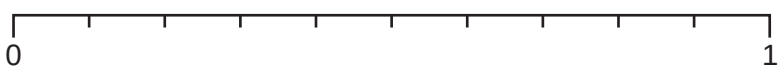
(b) Round 2.95 correct to 1 decimal place.

(b) ..... **[1]**

2 A bag contains only 8 red balloons and 2 blue balloons.
Witold chooses a balloon at random from the bag.

Use arrows to mark the probability of each of these events on the probability line below.

- Witold chooses a red balloon.
  Label the arrow A.
- Witold chooses a green balloon.
  Label the arrow B.



[2]

3 **(a)** **(i)** Convert 1.35 kg to grams.

(a)(i) ..... g **[1]**

(ii) Convert 40 cm to metres.

(ii) ..... m **[1]**

(b) A bottle contains 0.2 litres of medicine.

How many 5 ml spoons can be filled from the bottle?

(b) ..... **[2]**

4

4	-5	-9	9	5	-4

Choose from the cards above to complete the following problems.
Each card may be used once, more than once or not at all.

(a) $\square + \square = -1$ **[1]**

(b) $\square \times \square = -45$ **[1]**

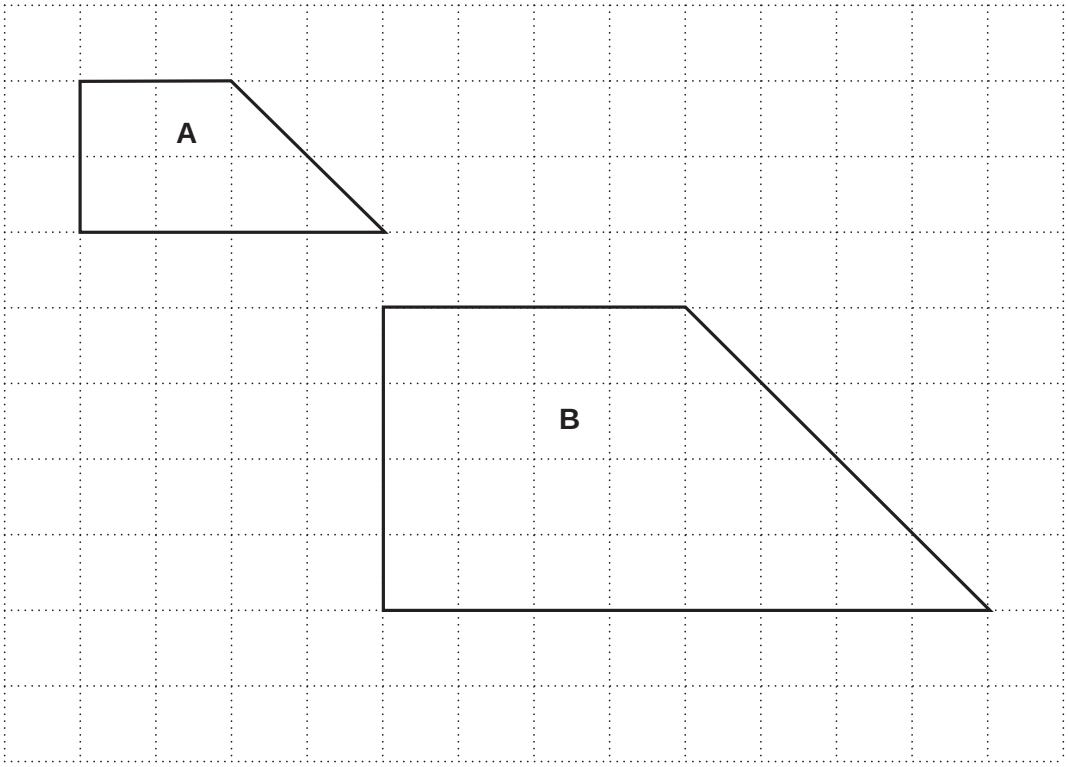
(c) $-8 - \square = -3$ **[1]**

(d) In this part you cannot use any of the cards more than once.

$$\frac{15 + \square}{\square} = \square$$

[2]

5 Shape **A** and shape **B** have been drawn on the one-centimetre grid.



(a) **(i)** Find the area of shape **A**.
Give the units of your answer.

(a)(i) ..... **[2]**

(ii) Measure the perimeter of shape **A**.

(ii) .....cm **[1]**

(b) Shape **B** is an enlargement of shape **A**.

What is the scale factor of this enlargement?

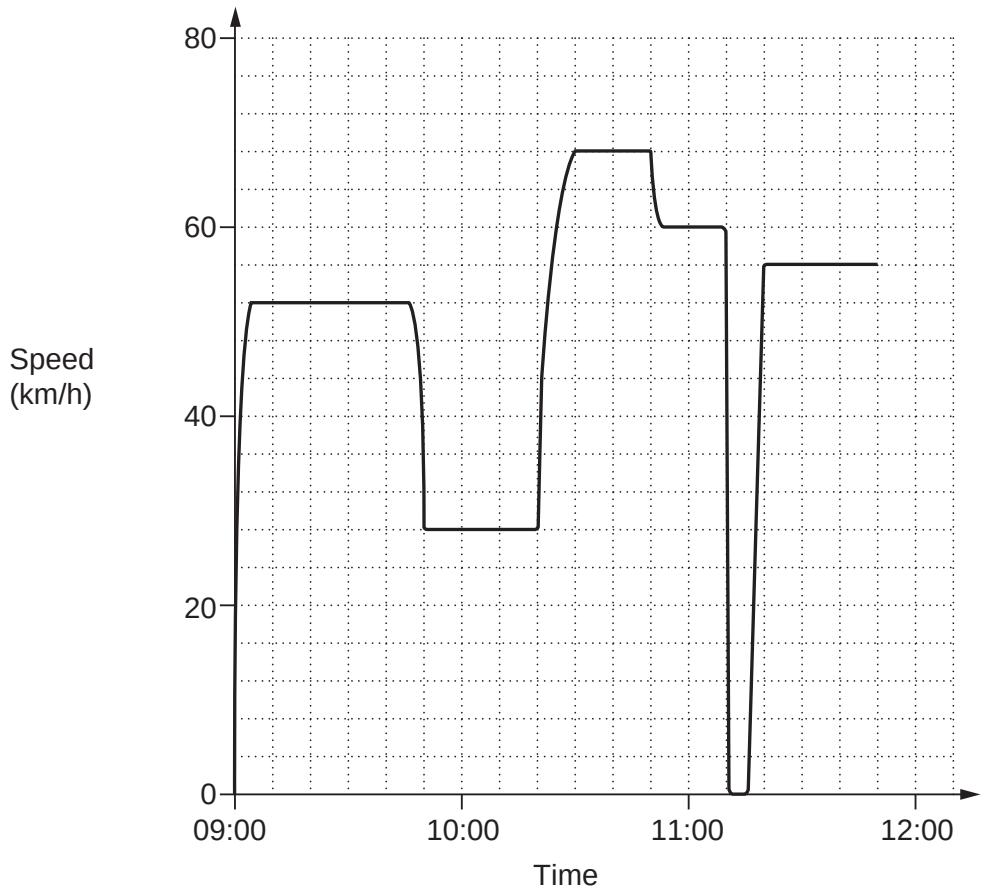
(b) ..... **[1]**

(c) Tick the statements that are true.

The perimeter of shape **A** is the same as the perimeter of shape **B**.	
Each angle of shape **A** is twice the size of each angle in shape **B**.	
The area of shape **A** is twice the area of shape **B**.	
The area of shape **B** is four times the area of shape **A**.	
The perimeter of shape **B** is twice the perimeter of shape **A**.	

[2]

6 Mark competes in a cycling race.
The graph shows his speed in kilometres per hour during the race.



(a) What was the fastest speed that Mark achieved during the race?

(a) ..... km/h **[1]**

(b) For how long did Mark cycle at this fastest speed?

(b) .....minutes **[1]**

(c) What could have happened at 11:10?

..... **[1]**

7 **(a)** Use an appropriate **metric** unit to complete each sentence.

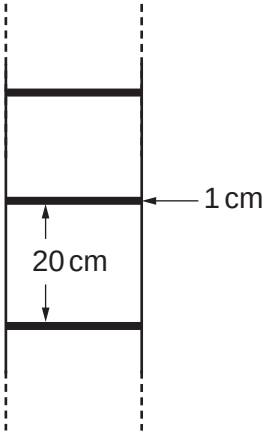
The height of a lamp post is 5.2 ..... .

The weight of an apple is 120 ..... .

The distance from Leeds to Liverpool is 104 ..... .

A petrol tank holds 50 ..... . **[4]**

(b) A ladder has 12 steps spaced 20 cm apart.
Each step has a thickness of 1 cm.
The first and last steps are positioned 15 cm from the ends of the ladder.



Not to scale

Calculate the total length of the ladder.
Give your answer in centimetres.

(b) .....cm **[4]**

8 **(a)** Simplify.

(i) $5x + x$

(a)(i) ..... **[1]**

(ii) $a \times a$

(ii) ..... **[1]**

(iii) $\frac{12p}{6}$

(iii) ..... **[1]**

(iv) $7x + 3y - 2x$

(iv) ..... **[1]**

(b) Work out the value of $2x^3$ when $x = 3$.

(b) ..... **[1]**

9 Emma has a pack of 20 ice lollies in her freezer.
There are:

- 5 orange ice lollies
- 3 strawberry ice lollies
- 10 blackcurrant ice lollies
- 2 lime ice lollies.

(a) Emma chooses an ice lolly at random from the pack.

Choose from the words below to complete each sentence.

likely	impossible	certain	evens	unlikely

It is ..... that she chooses a blackcurrant ice lolly.

It is ..... that she chooses a lime ice lolly.

It is ..... that she does **not** choose an orange ice lolly.

It is ..... that she chooses a cola ice lolly. **[4]**

(b) One week later there are just 10 ice lollies left.
Emma now chooses one of these at random.

- It is evens that she chooses an orange ice lolly.
- It is more likely that she chooses a strawberry ice lolly than a blackcurrant ice lolly.

Write down a possible number for each of the flavours of these 10 ice lollies.

(b) Orange .....

Strawberry .....

Blackcurrant .....

Lime ..... **[3]**

10 Here is part of a bus timetable.

Burnsden	06:50	08:35	14:20
Callissay	07:12	08:57	14:42
North Easden	07:30	09:15	15:00
South Easden	07:37	09:22	15:07
Plumbley	07:50	09:35	15:20
Rivenside Centre	08:05	09:50	15:35

(a) Tim catches the 14:20 bus in Burnsden.

What time should the bus arrive at South Easden?

(a) ..... **[1]**

(b) Alice gets to the bus stop in North Easden at 8:57 am.
She catches the next bus to Plumbley.

(i) How many minutes does she wait?

(b)(i) .....minutes **[1]**

(ii) How long should this bus take to get to Plumbley?

(ii) .....minutes **[1]**

(c) Helen takes 15 minutes to walk to the bus stop at Burnsden from her house.
She catches the 06:50 bus to Rivenside Centre.

How long is her total journey time from home to Rivenside Centre?

(c) ..... **[2]**

11 A hotel has 360 bedrooms.
One quarter of these bedrooms are single rooms.
The remainder are double rooms.

Type of room	Cost of room for one night
Single bedroom	£75.00
Double bedroom	£110.00

Calculate the total amount of money that the hotel receives in one night if all the single and double bedrooms are taken.

£ ..... **[5]**

12 Write a number in each box to make each statement true.

(a) $\frac{1}{3} \times \frac{\square}{\square} = \frac{1}{15}$ **[1]**

(b) $\frac{3}{4} \div \square = \frac{3}{8}$ **[1]**

13 **(a)** Solve.

(i) $x - 16 = 23$

(a)(i) ..... **[1]**

(ii) $7x = 24.5$

(ii) ..... **[1]**

(iii) $\frac{x}{4} = 12$

(iii) ..... **[1]**

(b) Write one number or letter in each box to make these statements true.

(i) $2(\square + 3) = 2x + \square$ **[2]**

(ii) $9x - 15 = \square(3x - \square)$ **[2]**

14 (a)* Matthew is buying baked beans.

The shop has three offers.

Pack of 6 for £2.90

Pack of 4 for £1.80

One tin for 65 p

The tins are identical.

Which offer represents the best value for money?

(a) ..... **[3]**

(b) Give one possible reason why Matthew might not buy the best value offer.

..... **[1]**

15 **(a)*** Alan is making a concrete base for a hot tub.
The concrete base is a cuboid of length 3 m, width 3 m and depth 18 cm.
The cost of the concrete is £158 for each cubic metre.
There is also a delivery charge of £36.

Calculate the total cost of the concrete, including delivery.

(a) £ ..... **[5]**

(b) The hot tub costs £4500 plus VAT at 20%.

(i) Work out 20% of £4500.

(b)(i) £ ..... **[1]**

(ii) Work out the cost of the hot tub including VAT.

(ii) £ ..... **[1]**

(c) It costs £1.35 per day for electricity to heat the water in the hot tub.
It also costs £12.50 per month for chemicals to treat the water in the hot tub.

Calculate the total cost of running the hot tub for one year (365 days).

(c) £ ..... **[3]**

16 200 students from Years 10 and 11 in a school were asked whether they preferred Maths lessons or Science lessons.

The table below summarises how they responded.

	Year 10	Year 11	Total
Maths	73		
Science			81
Total	110		200

(a) Complete the table. **[3]**

(b) One of the 200 students is chosen at random.

What is the probability that this student is from Year 10?

(b) ..... **[2]**

(c) One of these 200 students is chosen at random.

What is the probability that this student is from Year 11 and prefers Maths lessons?

(c) ..... **[1]**

17 **(a)** Ravi has a 500 g bag of sugar.
He uses 150 g of the sugar to make a cake.

What fraction of the bag of sugar does he use?
Give your answer as a fraction in its simplest form.

(a) ..... **[2]**

(b) Elaine is making bread.
She uses 3 pounds of flour.

Roughly how many kilograms of flour is this?

(b) .....kg **[2]**

18 A fence in Phil's garden is a rectangle 15 m long and 1.8 m high.
He is going to paint both sides of the fence.
One tin of paint covers 10 m^2.

What is the smallest number of tins of paint that Phil needs to buy?

..... **[3]**

19 One solution of the equation $x^3 - 4x = 25$ lies between 3 and 4.

Use trial and improvement to find this solution correct to 1 decimal place.
Show all your trials and their outcomes.

..... **[4]**

20 There are only red counters, white counters and blue counters in a box.
The table shows the probability of choosing a red counter or a white counter at random from the box.

Colour	Red	White	Blue
Probability	0.15	0.7	

(a) Complete the table to show the probability of choosing a blue counter. **[2]**

(b) Work out the probability that a counter, chosen at random from the box, is either red or white.

(b) ..... **[2]**

(c) Write **two** different facts about the **number** of counters of each colour that are in the box.

1.....

.....

2.....

.....

[2]

END OF QUESTION PAPER

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