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F

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS B (MEI)

B292B

Paper 2 Section B (Foundation Tier)

Candidates answer on the question paper.

OCR supplied materials:
None

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

Friday 10 June 2011
Morning

Duration: 1 hour

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

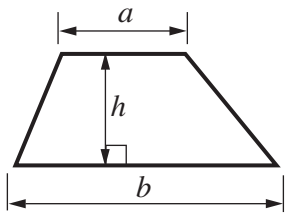
- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer 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).
- Show all your working. Marks may be given for a correct method even if the answer is incorrect.
- Answer **all** the questions.
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

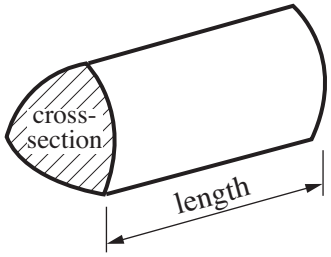
- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Section B starts with question 11.
- You are expected to use a calculator in Section B of this paper.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- The total number of marks for this Section is **50**.
- This document consists of **12** pages. Any blank pages are indicated.

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

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Timetable

Esanton	09:14	10:06	10:59
Mashford	09:28	10:20	11:13
Wishworth	09:49	10:41	11:34
Ranwood	11:14	12:06	12:59

Distance chart (km)

Esanton			
8	Mashford		
19	11	Wishworth	
94	86	75	Ranwood

Fares (adult ticket)

Esanton			
£2.72	Mashford		
£3.96	£3.30	Wishworth	
£9.24	£8.70	£7.85	Ranwood

Use the information in the tables to answer these questions.

(a) How long does it take to travel from Esanton to Mashford on the 10:06 train?

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

(b) What is the distance between Mashford and Ranwood?

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

(c) Jess buys 5 adult tickets from Esanton to Wishworth.

How much does she pay?

(c) £ ..... **[2]**

(d) What is the average speed of the 09:14 train between Esanton and Ranwood?

(d) ..... km/h **[2]**

12 **(a)** Write 0.25

(i) as a fraction,

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

(ii) as a percentage.

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

(b) Which is longer, $\frac{3}{4}$ of a metre or 600 mm?
Show how you decided.

.....

.....

.....

.....

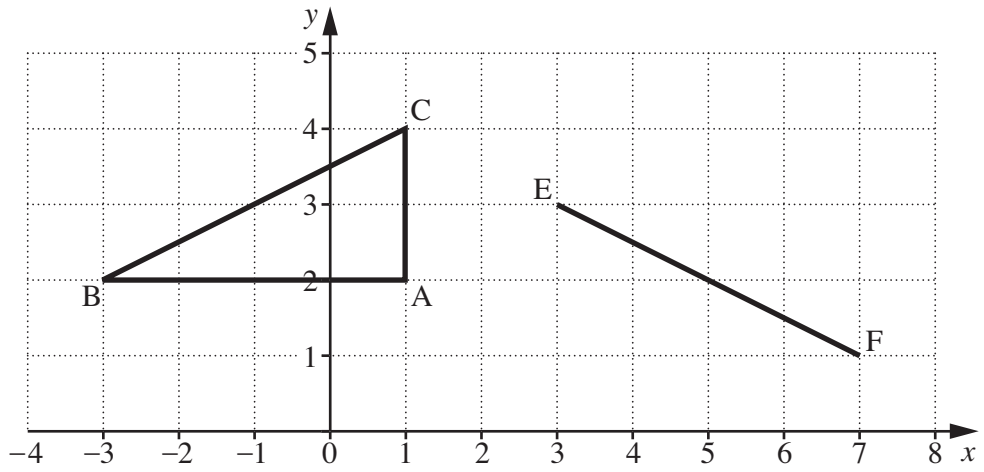
..... **[2]**

(c) Write these weights in order, heaviest first.

0.5 kg $\frac{1}{4}$ kg 2000 g

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

13



(a) Write down the coordinates of point A.

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

(b) Write down the coordinates of the midpoint of BC.

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

(c) Triangle DEF is congruent to triangle ABC.

On the grid, show **two** possible positions for D. **[2]**

14 A theme park has height restrictions on some of its rides.

Ride	Minimum height to ride
Disaster	1.4 m
Revolter	1.2 m
Swirly	1 m

(a) Toby is 1.25 m tall.

Which of these rides can he ride on?

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

(b) Some children visit the theme park.
Here are their heights, in metres.

1.25	1.52	1.21	1.64	0.93	1.06
1.16	0.89	1.63	1.48	1.29	1.42

(i) Fill in the frequency table to show the number of children who can go on each ride.

Rides they can go on	**Height**	**Tally**	**Frequency**
None of these rides	less than 1 m		
Swirly only	between 1 m and 1.2 m		
Revolter and Swirly only	between 1.2 m and 1.4 m		
All three rides	over 1.4 m		

[2]

(ii) Write down the modal class.

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

15 An electronic game has a red light, a blue light and a yellow light.
Each time a button is pressed the game randomly chooses a light to flash.

(a) Hannah presses the button once.

What is the probability that the red light flashes?

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

(b) Tadas presses the button twice.

(i) Complete the list to show all the possible outcomes. **[2]**

Red then Red

Red then Blue

(ii) What is the probability that the red light flashes first and then the blue?

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

(iii) What is the probability that at least one of the two flashes is red?

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

16

never	sometimes	always

For each part, fill in the box with a word from the list above.
Give a reason for each answer.

(a) The square of an even number is ☐ even,

because .....

.....

..... **[2]**

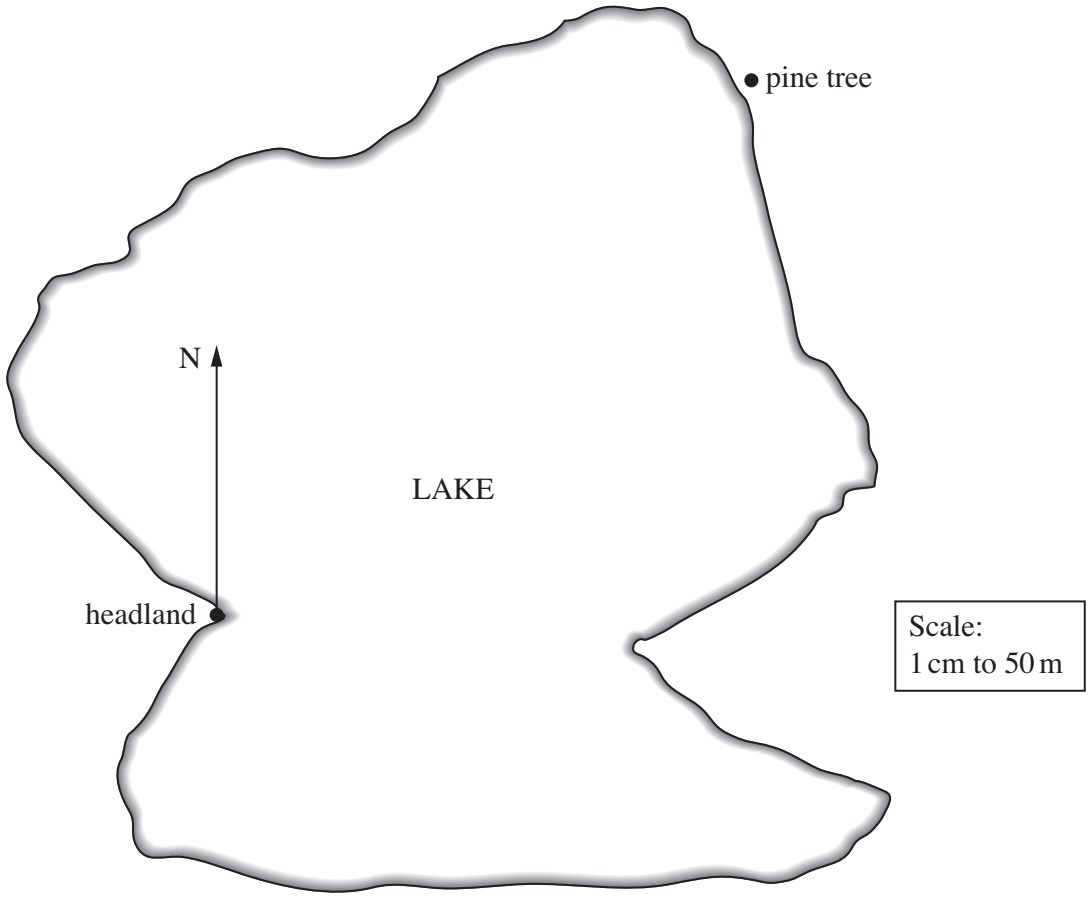
(b) The square of a number is ☐ negative,

because .....

.....

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

17 This is a scale drawing of a lake.



(a) Measure the bearing of the pine tree from the headland.

(a) .....° **[1]**

(b) Work out the actual distance from the headland to the pine tree.

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

(c) A boat is 175 m from the headland on a bearing of 160°.

Mark the position of the boat on the map. **[3]**

18 Work out.

$$\frac{4.32}{6.1 \times 3.92}$$

Give your answer correct to 3 decimal places.

..... **[2]**

19 **(a)** Write as a single power of p.

$$\frac{p^5}{p^8}$$

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

(b) The equation $x^3 + x^2 = 23$ has just one solution.

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

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

TURN OVER FOR QUESTION 20

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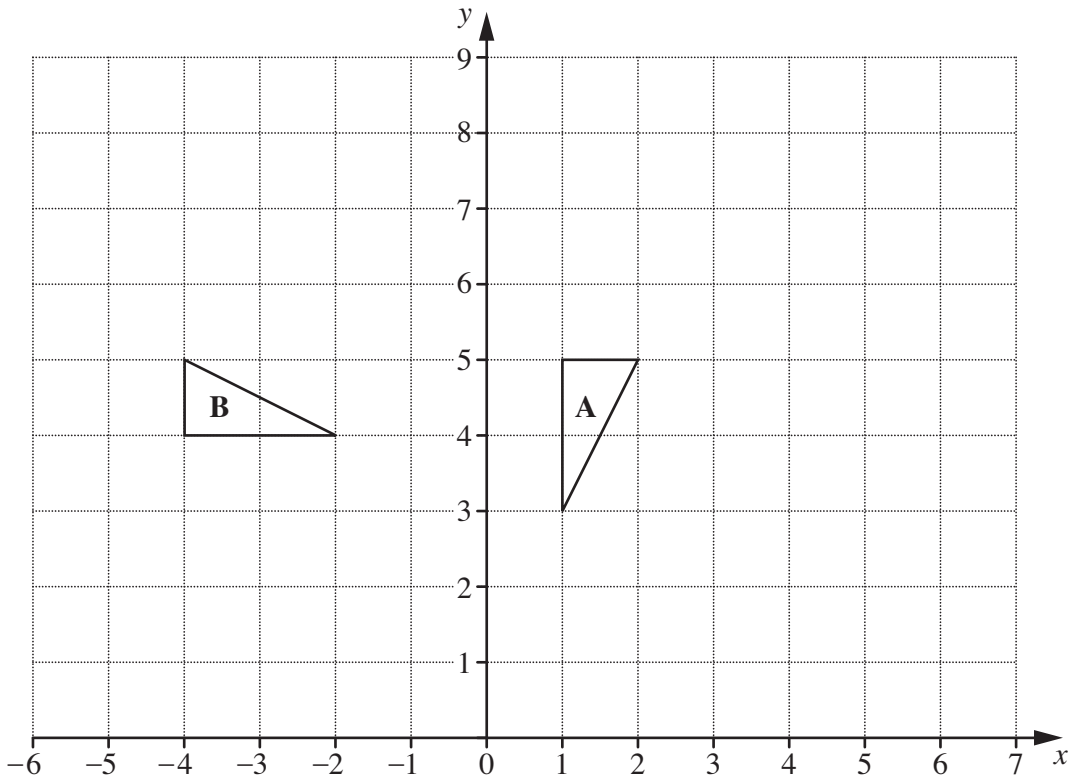

(a) Enlarge triangle **A** with centre (0, 4) and scale factor 3.
Label the image **C**. **[3]**

(b) Describe fully the **single** transformation that maps triangle **A** onto triangle **B**.

.....

.....

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