

**FREE-STANDING MATHEMATICS QUALIFICATION
INTERMEDIATE LEVEL**

Foundations of Advanced Mathematics (MEI)

6989

Candidates answer on the answer sheet.

OCR supplied materials:

- Answer sheet (MS4)

Other materials required:

- Eraser
- Scientific calculator
- Soft pencil
- Ruler

**Thursday 20 January 2011
Morning**

Duration: 2 hours



INSTRUCTIONS TO CANDIDATES

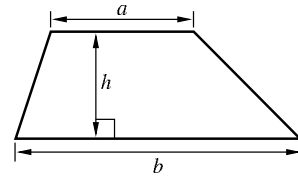
- Write your name clearly in capital letters, your centre number and candidate number on the answer sheet in the spaces provided unless this has already been done for you.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Do **not** write in the bar codes.
- There are **forty** questions in this paper. Attempt as many questions as possible. For each question there are four possible answers, **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the separate answer sheet.
- **Read very carefully the instructions on the answer sheet.**

INFORMATION FOR CANDIDATES

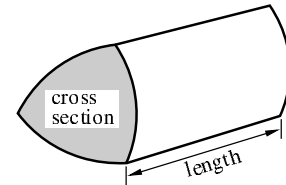
- Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
- This document consists of **24** pages. Any blank pages are indicated.

Formulae Sheet: 6989 Foundations of Advanced Mathematics

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



Volume of prism $= (\text{area of cross-section}) \times \text{length}$

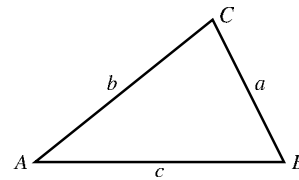


In any triangle ABC

Sine rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

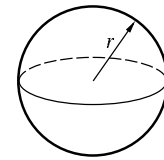
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle $= \frac{1}{2}ab \sin C$



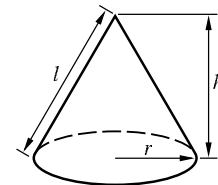
Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$



Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$,
where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

- 1 Three of the following statements are true and **one** is false. Which one is **false**?

A $(-2)^4 = 16$

B $22 - 5 \times 3 = 7$

C $\frac{(+6) \times (-8)}{(-3) \times (-4)} = 4$

D $(3 - 7) - (2 - 5) = -1$

- 2 Look at this list of numbers.

12 18 64 144 216 360

Three of the following statements are true and **one** is false. Which one is **false**?

A There are exactly 2 square numbers in the list.

B There are exactly 2 cube numbers in the list.

C There are exactly 2 factors of 36 in the list.

D There are exactly 2 multiples of 72 in the list.

- 3 Three of the following statements are true and **one** is false. Which one is **false**?

A 70% is less than $\frac{5}{7}$.

B $0.33 < \frac{1}{3} < 0.34$

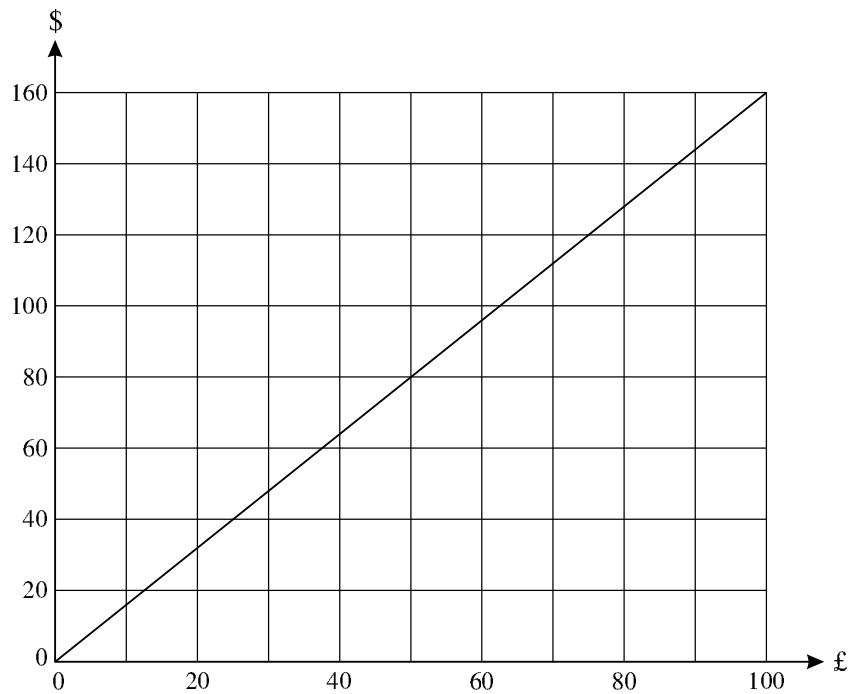
C When a quantity is divided in the ratio 2 : 3 the larger part is 60%.

D A quantity is divided into two parts. One part is three tenths of the whole so the parts are in the ratio 3 : 10.

4 Three of the following statements are true and **one** is false. Which one is **false**?

- A $2.5 \text{ kg} = 2500 \text{ g}$
- B $100 \text{ mm}^2 = 10 \text{ cm}^2$
- C $750 \text{ millilitres} = 0.75 \text{ litres}$
- D $10 \text{ centimetres per second} = 360 \text{ metres per hour}$

5 The diagram below shows a conversion graph between pounds (£) and Canadian dollars (\$) on a particular day.



Three of the following statements about the graph are true and **one** is false. Which one is **false**?

- A £40 is worth less than \$60.
- B \$140 is approximately £88.
- C £1 is worth more than \$1.
- D The gradient is the conversion factor from pounds to Canadian dollars.

6 Three of the following statements are true and **one** is false. Which one is **false**?

- A $75.69 = 76$, correct to the nearest integer.
- B $\frac{1}{15} = 0.067$, correct to 2 decimal places.
- C $\sqrt{20} = 4.5$, correct to the nearest tenth.
- D $5^6 = 15\,600$, correct to 3 significant figures.

7 Jayon is collecting data about car colours. She records the colours of 20 cars passing her house as follows.

Black	Silver	White	Blue	Black
Silver	Blue	Red	Silver	Blue
Green	Silver	Yellow	White	Blue
Red	Black	Silver	Black	Grey

In order to complete this question you may find it helpful to summarise the data using the tally chart below.

Car colour	Tally	Total
Black		
Blue		
Red		
Silver		
White		
Other (eg Green, Grey, Yellow, ...)		

Three of the following statements about Jayon's data are true and **one** is false. Which one is **false**?

- A The modal class is Silver.
- B On a pie chart, the sector representing Red will have an angle of 36° .
- C Nearly two thirds of the cars are Black, Blue or Silver.
- D Based on the data the probability that the next car to pass Jayon's house will be Black is $\frac{1}{6}$.

- 8 You are given $a = 4$, $b = -1$ and $c = \frac{1}{2}$.

Which **one** of the following expressions has the **greatest** value?

A $a + b + c$

B ab^2

C $\frac{a-b}{c}$

D $3abc$

- 9 Three of the following statements are true and **one** is false. Which one is **false**?

A The solution of $19 - 2x = 11$ is a positive integer.

B The solution of $5x - 2(x - 4) = -1$ is a negative integer.

C The solution of $\frac{3x-7}{4} = 5$ is positive but not an integer.

D The solution of $5(x + 8) = -17$ is negative but not an integer.

10 Three of the following statements are true and **one** is false. Which one is **false**?

A $\frac{9x^8}{3x^2} = 3x^6$

B $\frac{1}{4x} = 4x^{-1}$

C $2x^7 \times \frac{1}{2}x^4 = x^{11}$

D $\left(\frac{3x^2}{2}\right)^3 = \frac{27x^6}{8}$

11 Two groups of students do a test. The marks (out of 10) are as follows.

Group A	6	7	7	7	8	8	9	9
Group B	2	3	5	7	8	8	9	10

Three of the following statements are true and **one** is false. Which one is **false**?

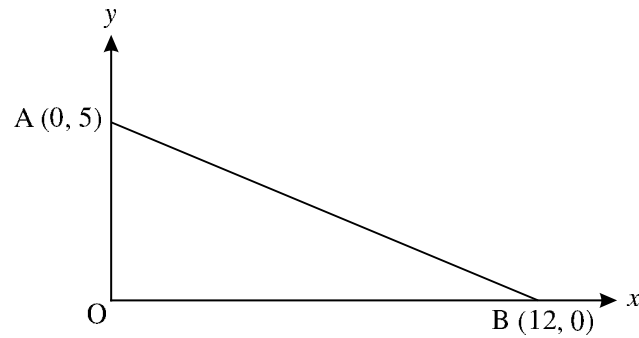
A The mean mark for Group B is 6.5.

B The range of marks for Group A is 3.

C The median mark is the same for each Group.

D The marks in Group A have a greater spread than the marks in Group B.

12



Three of the following statements about the diagram are true and **one** is false. Which one is **false**?

- A** The gradient of the line AB is $\frac{5}{12}$.
- B** The equation of the line AB may be written as $12y + 5x = 60$.
- C** The point $(3, 3.75)$ lies on the line AB.
- D** The length of AB is 13 units.

13 Three of the following statements are true and **one** is false. Which one is **false**?

- A** The price of a bicycle has been reduced by 10% to £135. The original price was £150.
- B** A salary of £26 000, when increased by 2.5%, becomes £26 650.
- C** A 1 litre tin of paint covers an area of 2.5 m^2 , so a 5 litre tin will cover an area of 12.5 m^2 .
- D** x and y are inversely proportional, so when x is doubled then y is doubled.

14 Which **one** of the following expressions has the **least** value?

A $2\frac{1}{4} + \frac{7}{8}$

B $4\frac{1}{8} - 1\frac{3}{8}$

C $1\frac{1}{2} \times 1\frac{3}{4}$

D $7\frac{2}{3} \div 2\frac{2}{3}$

15 Amber and Gemma are doing work on standard form.

- Amber claims that $(5 \times 10^6)^2 = 2.5 \times 10^{13}$.
- Gemma claims that $(4 \times 10^{-8}) \div (8 \times 10^{-4}) = 5 \times 10^{-5}$.

Which **one** of the following statements is **true**?

- A Amber and Gemma are both correct.
- B Amber is correct and Gemma is incorrect.
- C Amber is incorrect and Gemma is correct.
- D Amber and Gemma are both incorrect.

- 16 Three of the following statements are reasonable and **one** is unreasonable. Which **unreasonable**?

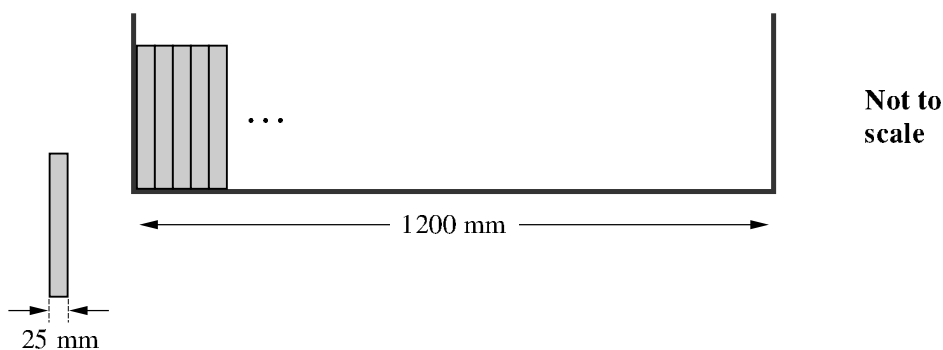
- A The amount of water in a half full bath is measured in litres.
- B The thickness of a piece of cardboard is measured in millimetres.
- C The time in which a car can reach 50 mph from rest is measured in seconds.
- D The weekly rainfall in London is measured in metres.

- 17 Three vectors are given by $\mathbf{a} = \begin{pmatrix} 4 \\ 0 \end{pmatrix}$, $\mathbf{b} = \begin{pmatrix} -2 \\ 1 \end{pmatrix}$ and $\mathbf{c} = \begin{pmatrix} 3 \\ -1 \end{pmatrix}$.

Which **one** of the following is the **correct** value of $\mathbf{a} + 2\mathbf{b} - 3\mathbf{c}$?

- A $\begin{pmatrix} -9 \\ 0 \end{pmatrix}$ B $\begin{pmatrix} -9 \\ 5 \end{pmatrix}$ C $\begin{pmatrix} 9 \\ 1 \end{pmatrix}$ D $\begin{pmatrix} 9 \\ 5 \end{pmatrix}$

- 18 The length of a shelf is 1200 mm, correct to the nearest 10 mm. Books which are each 25 mm thick, correct to the nearest millimetre, are placed on the shelf as shown.



Three of the following statements are true and **one** is false. Which one is **false**?

- A The length of the shelf is not greater than 1205 mm.
- B The minimum thickness of a book is 24.5 mm.
- C 47 books can definitely be placed on the shelf.
- D It may be possible to place 49 books on the shelf.

19 Three of the following statements are true and **one** is false. Which one is **false**?

A $4x(y - 2) - 3y(x - 1) = xy + 3y - 8x$

B $(5x + 4)(5x - 4) = 25x^2 - 16$

C $(x + 3)^2 = x^2 + 9$

D $2x^3y + 6x^2y^3 = 2x^2y(x + 3y^2)$

20 Charlie makes a scale drawing of the front of his house using a scale of 1 : 20.

Three of the following statements are true and **one** is false. Which one is **false**?

A The scale can be written 5 cm : 1 m.

B The lounge window is 1.2 m high so it will be 6 cm high on the scale drawing.

C On the scale drawing the width of the garage door is 10 cm so the actual width of the garage door is 2 m.

D The front door has an area of 2.5 m^2 so it will have an area of 12.5 cm^2 on the scale drawing.

21 Three of the following statements are true and **one** is false. Which one is **false**?

A The solution of $2x - 1 > 9$ is $x > 5$.

B The solution of $\frac{3x}{4} \leq 2$ is $x \leq \frac{8}{3}$.

C The solution of $5 - x \leq 1$ is $x \geq 4$.

D The solution of $2(3x - 4) - 5 > 0$ is $x < \frac{13}{6}$.

22 Three of the following statements are true and **one** is false. Which one is **false**?

A $\cos 120^\circ = -\frac{1}{2}$

B There are exactly two values of θ in the interval $0^\circ \leq \theta \leq 360^\circ$ for which $\tan \theta = 1$.

C For any value of θ , $0 \leq \sin \theta \leq 1$.

D In the interval $0^\circ \leq \theta \leq 180^\circ$, $\cos \theta$ decreases as θ increases.

23 Three of the following statements are true and **one** is false. Which one is **false**?

- A** Given $x^2 - 5x + 6 = 0$ then either $x - 2 = 0$ or $x - 3 = 0$.
- B** Given $x^2 + x - 6 = 0$ then either $x - 2 = 0$ or $x + 3 = 0$.
- C** Given $x^2 - 10x - 24 = 0$ then either $x - 6 = 0$ or $x + 4 = 0$.
- D** Given $x^2 + 2x - 24 = 0$ then either $x + 6 = 0$ or $x - 4 = 0$.

24 Next week Amy and Jack will each make exactly one visit to the skating arena. Their visits, which are independent, are equally likely to be on Monday, Tuesday, Wednesday, Thursday or Friday.

Three of the following statements are true and **one** is false. Which one is **false**?

- A** The probability that Amy's visit is not on Monday is $\frac{4}{5}$.
- B** The probability that Jack's visit is on Tuesday or Wednesday is $\frac{2}{5}$.
- C** The probability that Amy and Jack both visit on Thursday is $\frac{1}{25}$.
- D** The probability that at least one of their visits is on Friday is $\frac{8}{25}$.

25 Which **one** of the following is the **correct** solution of the equation $7x^2 - 3 - 12x = 0$?

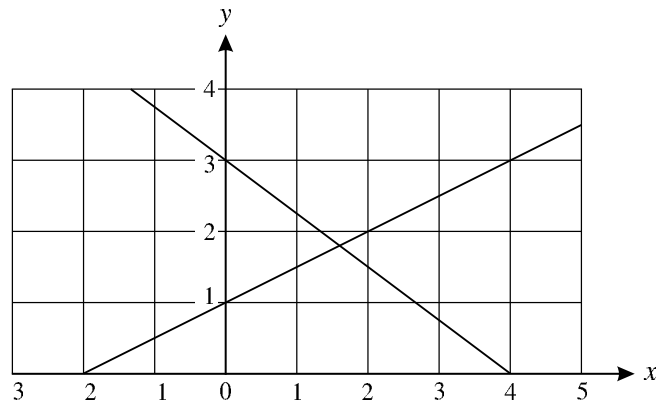
- A $\frac{12 \pm \sqrt{228}}{14}$ B $\frac{-12 \pm \sqrt{228}}{14}$ C $\frac{3 \pm \sqrt{345}}{14}$ D $\frac{-3 \pm \sqrt{345}}{14}$

26 The running cost of Avtar's car is n pence for every mile he drives. In a year he drives m miles.

Which **one** of the following expressions is the **correct** running cost (in pounds) for the year?

- A $\frac{mn}{100}$ B $100mn$ C $\frac{100m}{n}$ D $\frac{n}{100m}$

27 The graph below shows two straight lines.



Which **one** of the following pairs of simultaneous equations can be **solved** using this graph?

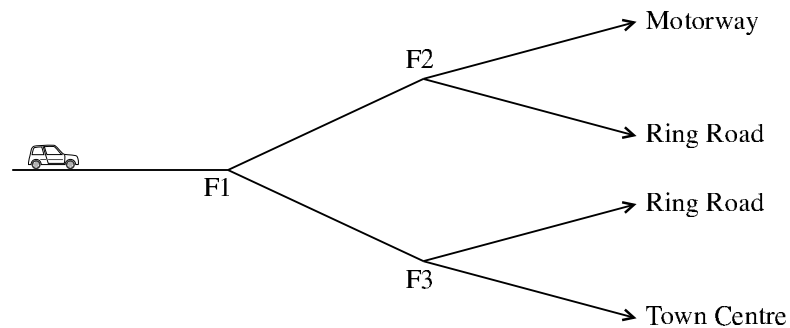
- A $y = x + 1$ and $4x + 3y = 9$
 B $2y = x + 2$ and $3x + 4y = 12$
 C $2y = x + 2$ and $4x + 3y = 9$
 D $y = x + 1$ and $3x + 4y = 12$

- 28 You are given the vectors $\mathbf{a} = 2\mathbf{i} - 3\mathbf{j}$, $\mathbf{b} = \mathbf{i} + 4\mathbf{j}$ and $\mathbf{c} = 4\mathbf{i} - 6\mathbf{j}$.

Three of the following statements are true and **one** is false. Which one is **false**?

- A The modulus of vector \mathbf{a} is 13.
- B The angle between vectors \mathbf{b} and \mathbf{i} is 76° , correct to the nearest degree.
- C The vectors \mathbf{a} and \mathbf{c} have the same direction.
- D $2\mathbf{b} + \mathbf{c} = 2(3\mathbf{i} + \mathbf{j})$

- 29 Rachel is driving her car on the road network shown.



She has lost her way and at each fork (labelled F1, F2 and F3) she goes either left or right. The probability that she goes left at F1 is 0.8. If she goes left at F1 then the probability that she heads for the motorway at F2 is 0.7. If she goes right at F1 then the probability that she heads for the town centre at F3 is 0.4.

Three of the following statements are true and **one** is false. Which one is **false**?

- A The probability that Rachel drives towards the motorway is 0.56.
- B The probability that Rachel drives towards the town centre is 0.08.
- C The probability that Rachel drives towards the ring road is 0.24.
- D The probability that Rachel took the same direction at both the forks she comes to is 0.64.

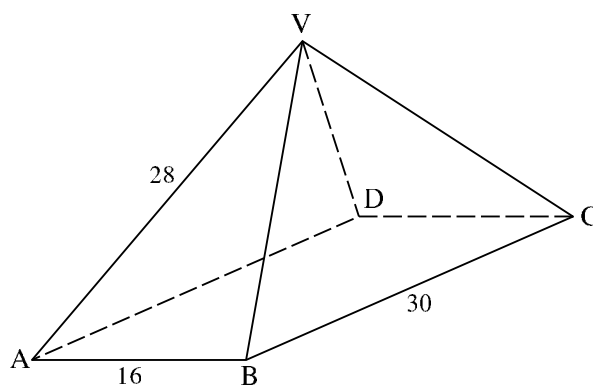
- 30 Which **one** of the following is the **correct** solution of this pair of simultaneous equations?

$$-2x + y = 4$$

$$2x + y = -8$$

- A $x = -3, y = -2$
 B $x = 3, y = 2$
 C $x = 1, y = 6$
 D $x = -1, y = -6$

- 31 The diagram shows a pyramid with vertex V and a rectangular base ABCD. $AB = 16$, $BC = 30$ and $VA = VB = VC = VD = 28$.



Three of the following statements are true and **one** is false. Which one is **false**?

- A $AC = 34$
 B Angle $BCA = 28^\circ$, correct to the nearest degree.
 C The height of V above the base is 22.2, correct to 1 decimal place.
 D Angle $AVC = 105^\circ$, correct to the nearest degree.

32 Three of the following statements are true and **one** is false. Which one is **false**?

A $3x + 4y = 8$ may be rearranged to give $y = -\frac{3x}{4} + 2$.

B $x = \sqrt{\frac{2E}{k}}$ may be rearranged to give $E = \frac{1}{2}kx^2$.

C $T = ar^{n-1}$ may be rearranged to give $r = \sqrt[n]{\frac{T}{a}} + 1$.

D $\frac{h}{H} = \frac{r}{R}$ may be rearranged to give $H = \frac{hR}{r}$.

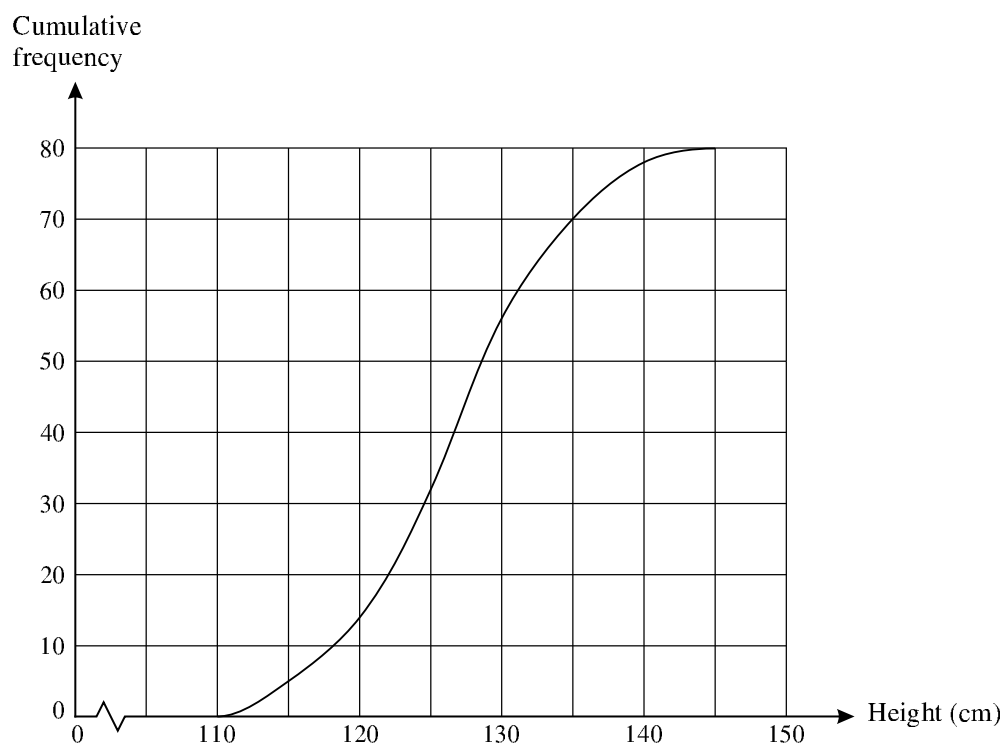
33 Three of the following statements are true and **one** is false. Which one is **false**?

- A If the perimeter of a square is 60 cm, then the area is 225 cm^2 .
- B If the diameter of a circle is 5 cm, then the circumference is $10\pi \text{ cm}$.
- C If the volume of a cube is 1000 cm^3 , then the area of a face is 100 cm^2 .
- D If the volume of a cylinder is 800 cm^3 and the area of its cross-section is 50 cm^2 , then the height is 16 cm.

34 Which **one** of the following is a **correct** simplification of $\frac{3x-4}{5} - \frac{4x-7}{2}$?

- A $\frac{-14x-15}{10}$
- B $\frac{-14x+27}{10}$
- C $\frac{-14x+31}{10}$
- D $\frac{-14x-43}{10}$

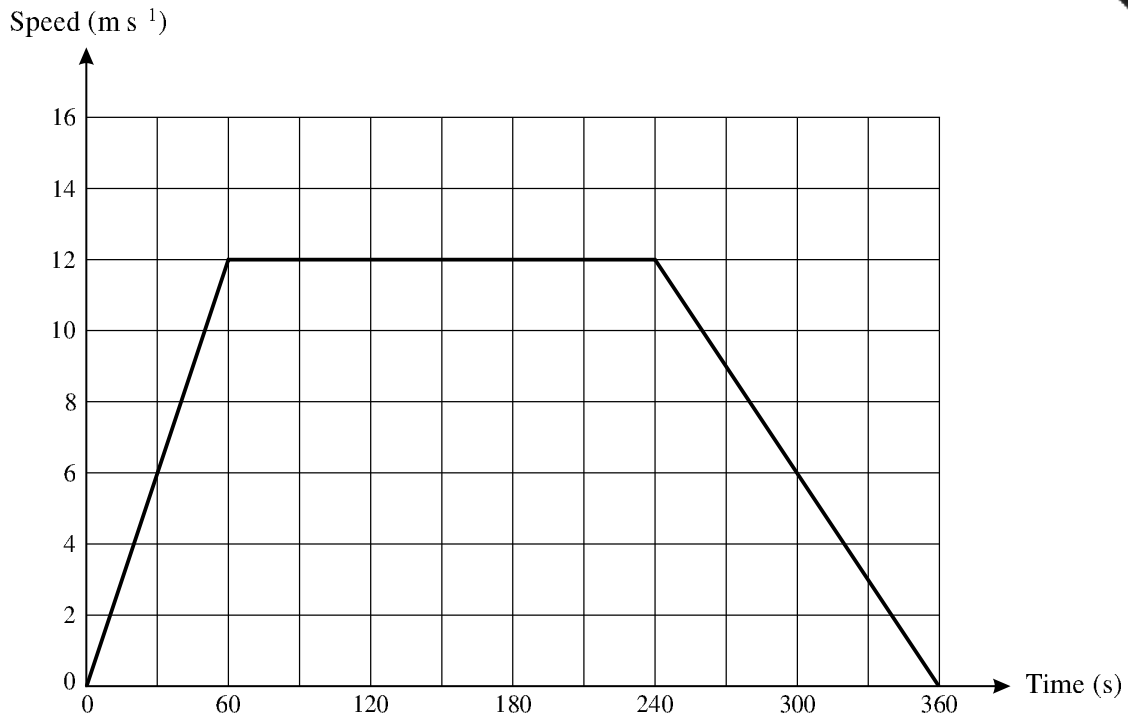
- 35 This cumulative frequency diagram summarises the heights of 80 boys.



Three of the following statements are true and **one** is false. Which one is **false**?

- A Approximately 13 boys are less than 120 cm tall.
- B Approximately 55 boys are more than 130 cm tall.
- C The median height is approximately 127 cm.
- D The interquartile range is approximately 10 cm.

- 36 This graph shows the speed of a train when travelling from one station to the next.



Three of the following statements are true and **one** is false. Which one is **false**?

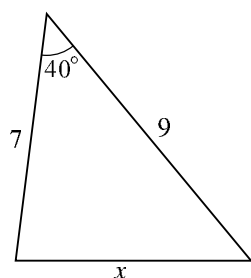
- A The speed is constant for half the journey time.
 - B The acceleration after 40 seconds is 8 m s^{-2} .
 - C The distance covered is 3.24 km.
 - D The speed after 15 seconds is the same as the speed after 330 seconds.
- 37 Here are three statements about sequences.
- The n th term of the sequence 8, 14, 20, 26, 32, ... is of the form $an + b$ where a and b are constants.
 - The n th term of the sequence 2, 5, 10, 17, 26, ... is of the form $n^2 + 1$.
 - 6, 18, 54, 162, 486, ... is an exponential sequence.

How **many** of these three statements are **true**?

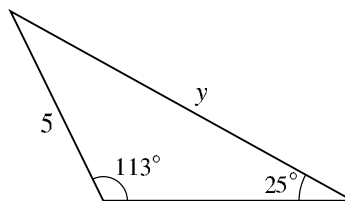
- A 0 B 1 C 2 D 3

- 38 Liam and Tom are solving problems in trigonometry.

Liam's problem



Tom's problem



Not to
scale

- Liam claims that $x = 5.8$ correct to 1 decimal place.
- Tom claims that $y = 7.9$, correct to 1 decimal place.

Which **one** of the following statements is **true**?

- A Liam and Tom are both correct.
- B Liam is correct and Tom is incorrect.
- C Liam is incorrect and Tom is correct.
- D Liam and Tom are both incorrect.

39 Starting with a positive number, x , do the following.

- add 5 to it
- square the result
- subtract 9
- subtract twice the original number
- take the positive square root.

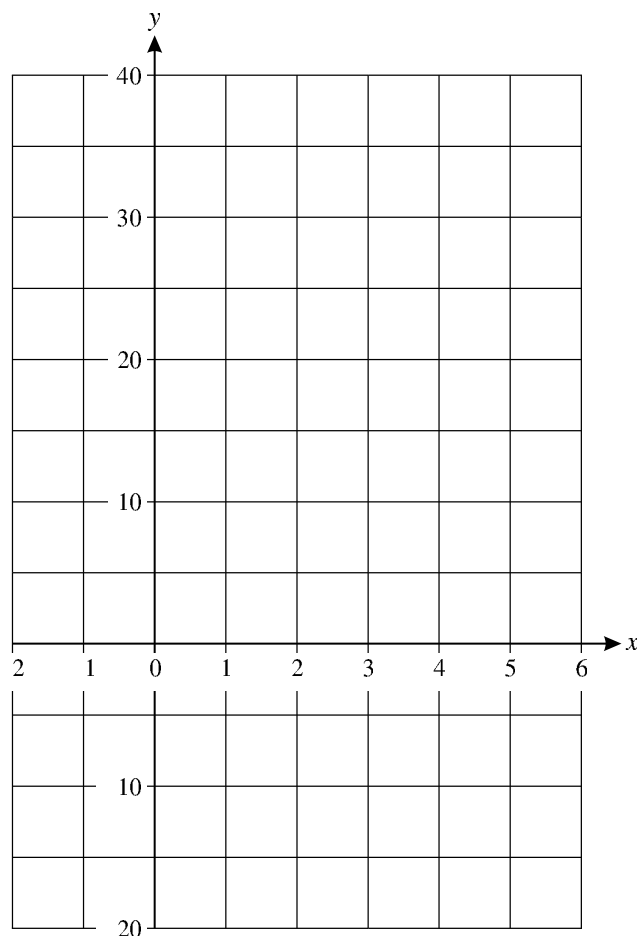
Which **one** of the following statements is **true**?

- A** The answer will always be greater than x .
- B** The answer will always be equal to x .
- C** The answer will always be less than x .
- D** The relationship between the answer and x varies depending on the value of x which is chosen to start with.

- 40 The table below shows points on the graph of $y = 2x^3 - 11x^2 + 12x + 5$.

x	-1	0	1	2	3	4	5
y	-20	5	8	1	-4	5	40

In order to answer this question you should draw the graph on the grid below.



Three of the following statements are true and **one** is false. Which one is **false**?

- A** The equation $2x^3 - 11x^2 + 12x + 5 = 0$ has two positive roots and one negative root.
- B** The equation $2x^3 - 11x^2 + 12x + 5 = 22$ has only one root.
- C** There are two points on the curve $y = 2x^3 - 11x^2 + 12x + 5$ at which the gradient is zero.
- D** The curve $y = 2x^3 - 11x^2 + 12x + 5$ has negative gradient at $x = -0.5$.

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Foundations of Advanced Mathematics (MEI)

Free Standing Mathematics Qualification **6989**

Examiner's Report

January 2011

6989/R/11J

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This report on the Examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

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Foundations of Advanced Mathematics – 6989

There were just over 600 entries for this session; this represents a slight decrease in entries. The mean mark was 23.6. The lowest mark on this paper was 8. One candidate achieved full marks, 4 each scored 39, 38 and 36 with 11 scoring 36.

In this paper there were 26 questions in which at least one candidate offered no response; there were a number of questions where 3 or 4 candidates did not give a response. Given that there is no penalty for an incorrect response this is surprising.

In all questions each of the distracting answers was selected by at least one candidate.

In 10 questions the correct response was chosen by a minority of candidates and in 5 further questions an incorrect response was chosen by a majority of candidates; this is much higher than usual.

Q4 (Conversion of metric units)

A significant minority chose the conversion of cm per second to km per hour as being incorrect.

Q10 (powers in algebraic terms)

$\frac{1}{4x} = 4x^{-1}$ was deemed to be incorrect by only 33% while $\left(\frac{3x^2}{2}\right)^3 = \frac{27x^6}{8}$ was chosen to be incorrect by 38%.

Q12 (Coordinate geometry of the straight line)

Only 41% decided that response A was the incorrect one. The absolute value here is correct but the gradient is negative. Alternative responses were evenly spread.

Q18 (Arithmetic; approximations)

The response that 47 books can definitely be placed on the shelf is incorrect was chosen by 31% while 46% chose the response that 49 books might fit as incorrect.

Q22 (Trigonometrical ratios)

Only 36% thought that, for all values of θ , $0 \leq \sin \theta \leq 1$, while 41% thought that there were not exactly 2 values in $0 \leq \theta \leq 360$ for which $\tan \theta = 1$. (Whether they thought that there were fewer or more, of course, we do not know!)

Q25 (Solution of quadratic equation by formula)

34% rearranged the equation so that it was in the "standard" format, applied the formula and obtained the response A. 40%, however, applied the formula with the coefficients $a = 7$, $b = -3$ and $c = -12$.

Q26 (Construction of expression from words)

Only 46% decided that the correct thing to do was to divide by 100 to turn pence into pounds. 39% chose to multiply.

Q27 (Construction of equations of lines from graph)

Only 44% chose the correct response; the rest were equally spread.

Q28 (Vectors)

The majority of candidates accepted that the modulus of the vector was 13 rather than $\sqrt{13}$. Responses B and C were equally popular.

Q31 (3-D trigonometry)

Only 36% gave the response D. This may be because candidates who failed to work 3-D pythagoras or a trigonometrical ratio in a 3-D context correctly thought that they had already found an incorrect answer.

Q32 (Rearrangement of formulae)

Only a minority chose the correct response; the remaining choices were equally spread.

Q36 (Constant acceleration speed time graph)

Misunderstanding of the scales of the axes possibly led only 34% to say that the value given for the acceleration was wrong, while 43% incorrectly chose the distance as the incorrect answer.

Q37 (Algebraic sequences)

This question included all three of the sequences that are expected to be known by candidates. The three statements gave a correct example of each and all three were correct (response D, chosen by only 27%). 44% decided that only 2 of the statements were correct, though we do not know which one was thought to be wrong.

Q38 (Trigonometry; sine and cosine rules)

Just under half the candidates chose the correct response; other responses were equally spread.

Q40 (Algebra; graphical solution of cubic equation)

Only 38% were able to confirm that the gradient of the curve was negative at $x = -0.5$. The other responses were equally spread between B and C with a few choosing A.

As in previous sessions I offer a summary of questions and topics with the approximate percentage of candidates giving the correct responses.

Question Topic

91 – 100%	5	Arithmetic; conversion graph
	16	Arithmetic; appropriate units
81 – 90%	1	Arithmetic; order of operations
	11	Data handling; average and range of small sets of data
	30	Algebra; solution of simultaneous equations
71 - 80%	3	Arithmetic; ratios, fractions, percentages
	7	Data handling; mode, pie chart, simple probability
	13	Arithmetic; percentage increase and decrease
	15	Arithmetic; standard form
	17	Vectors
	24	Probability; independent events
	29	Probability; dependent events
	39	Algebra; following a list of instructions
61 - 70%	6	Arithmetic; approximations and rounding
	8	Algebra; substitution
	19	Algebraic manipulation
	20	Arithmetic; scale factors
	23	Algebra; solution of quadratic equations by factorisation
	33	Arithmetic; mensuration

	35	Handling data; cumulative frequency
51 - 60%	2	Arithmetic; factors, multiples
	9	Algebra; solution of linear equations
	14	Arithmetic; addition and subtraction of fractions
	21	Algebra; inequalities
	34	Algebra; Addition of algebraic fractions
41 - 50%	4	Arithmetic; Conversion of metric units
	12	Coordinate geometry of the straight line
	26	Algebra; construction of expression from words
	27	Coordinate geometry; equations of straight lines from graph
	32	Algebra; rearrangement of formulae
	38	Trigonometry; sine and cosine rules
31 - 40%	10	Algebra; powers
	18	Arithmetic; approximations
	22	Trigonometrical ratios
	25	Algebra; solution of quadratic equation by formula
	31	Trigonometry; 3 dimensions
	36	Algebra; constant acceleration speed time graph
	40	Algebra; graphical solution of cubic equation
21 - 30%	28	Vectors
	37	Algebra; sequences

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Raw mark boundaries January 2011 series

FSMQ / Level 2 Award / Entry Level

Free Standing Mathematics Qualification (FSMQ)									

Level 2 Award Thinking and Reasoning Skills								
		Max Mark			d	m	p	u
901/01	Written Paper	Raw	60	48	36	25	0	
		UMS	60	48	36	24	0	
902/01	Case Study	Raw	60	46	35	25	0	
		UMS	60	48	36	24	0	

Entry Level Business Studies (linear)									
343	Business Studies	This specification has no entries in January 2011							

Entry Level Certificate Geography C (Bristol Project) (unitised) (legacy)		Max Mark	3	2	1	u
421	Geography C: Unit 1 Internal Assessment		This unit has no entries in January 2011			
422/01	Geography C: Unit 2 Oral Based on the Decision Making Exercise	Raw	30	18	10	5
		UMS	60	48	36	24
						0

Entry Level Certificate Mathematics B (linear) (legacy)								
			Max Mark	3	2	1	u	
913/01	Bronze	Raw	20	n/a	n/a	16	0	
913/02	Silver	Raw	31	n/a	24	20	0	
913/03	Gold	Raw	33	26	21	n/a	0	