Surname	Centre Number	Candidate Number
Other Names		0

GCSE

4370/03

MATHEMATICS – LINEAR
PAPER 1
FOUNDATION TIER

P.M. MONDAY, 11 June 2012

$1\frac{3}{4}$ hours

CALCULATORS ARE NOT TO BE USED FOR THIS PAPER

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3·14.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

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

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **6**.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1	**11**	
2	**7**	
3	**4**	
4	**9**	
5	**6**	
6	**6**	
7	**6**	
8	**3**	
9	**8**	
10	**4**	
11	**6**	
12	**6**	
13	**4**	
14	**6**	
15	**5**	
16	**6**	
17	**3**	
TOTAL MARK		

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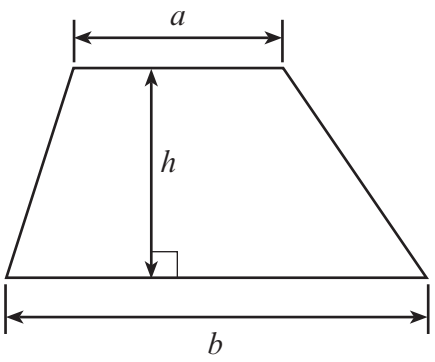
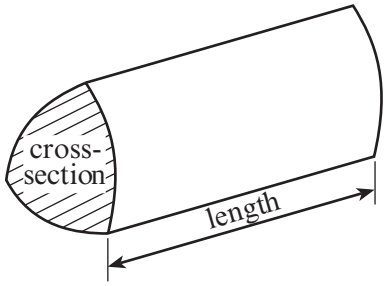
Formula List

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



Volume of prism = area of cross-section × length



Examiner only

1. *(a)* (i) Write down, in figures, the number fifty thousand, two hundred and forty four.

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[1]

(ii) Write down, in words, the number 67 304.

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[1]

(b) Using only the numbers in the following list,

34 41 76 12 37 32 21

write down

(i) two numbers that add up to 46,

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[1]

(ii) two numbers which differ by 39,

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[1]

(iii) a multiple of 7.

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[1]

(c) Write 7629

(i) correct to the nearest 100,

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[1]

(ii) correct to the nearest 1000.

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[1]

(d) Write down all the factors of 25.

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[2]

(e) Michelle uses each of the digits 4, 7, 3 and 8 once to make a four-digit number.

(i) What is the largest number that she can make?

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[1]

(ii) What is the smallest odd number that she can make?

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[1]

Examiner only

2. *(a)* Write down the value of the 7 in the number 35 741.

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[1]

(b) Subtract 156 from 384.

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[1]

(c) Kate has a £20 note.
A notebook costs £1.60.
She buys as many notebooks as she can.
How much money will she have left over?

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[3]

(d) **Showing all your working**, find an **estimate** for the value of 51·8 × 10·2.

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[2]

Examiner only

3.

The formula for the cost of buying a bicycle on credit is

cost = monthly payment × 9 + deposit

(a) Find the **cost** of a bicycle, when the **monthly payment** is £15 and the **deposit** is £30.

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[2]

(b) The **cost** of another bicycle is £220.
Find the **monthly payment** when the **deposit** is £40.

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[2]

4370 030005

Examiner only

4. Gethin has put some coloured discs into a bag. The discs are identical in shape, but some are coloured red (R), others black (B), yellow (Y) or green (G).
He shakes the bag and pulls a disc out of the bag without looking.
He writes down its colour and puts the disc back into the bag.
He does this 40 times and here are his results.

B	B	G	R	G	B	Y	G	B	R
R	R	Y	B	R	Y	R	B	G	B
Y	G	B	R	B	B	Y	B	Y	B
G	B	G	B	Y	B	R	Y	B	R

(a) Using the squared paper grid on the opposite page, draw a bar chart for the data given.

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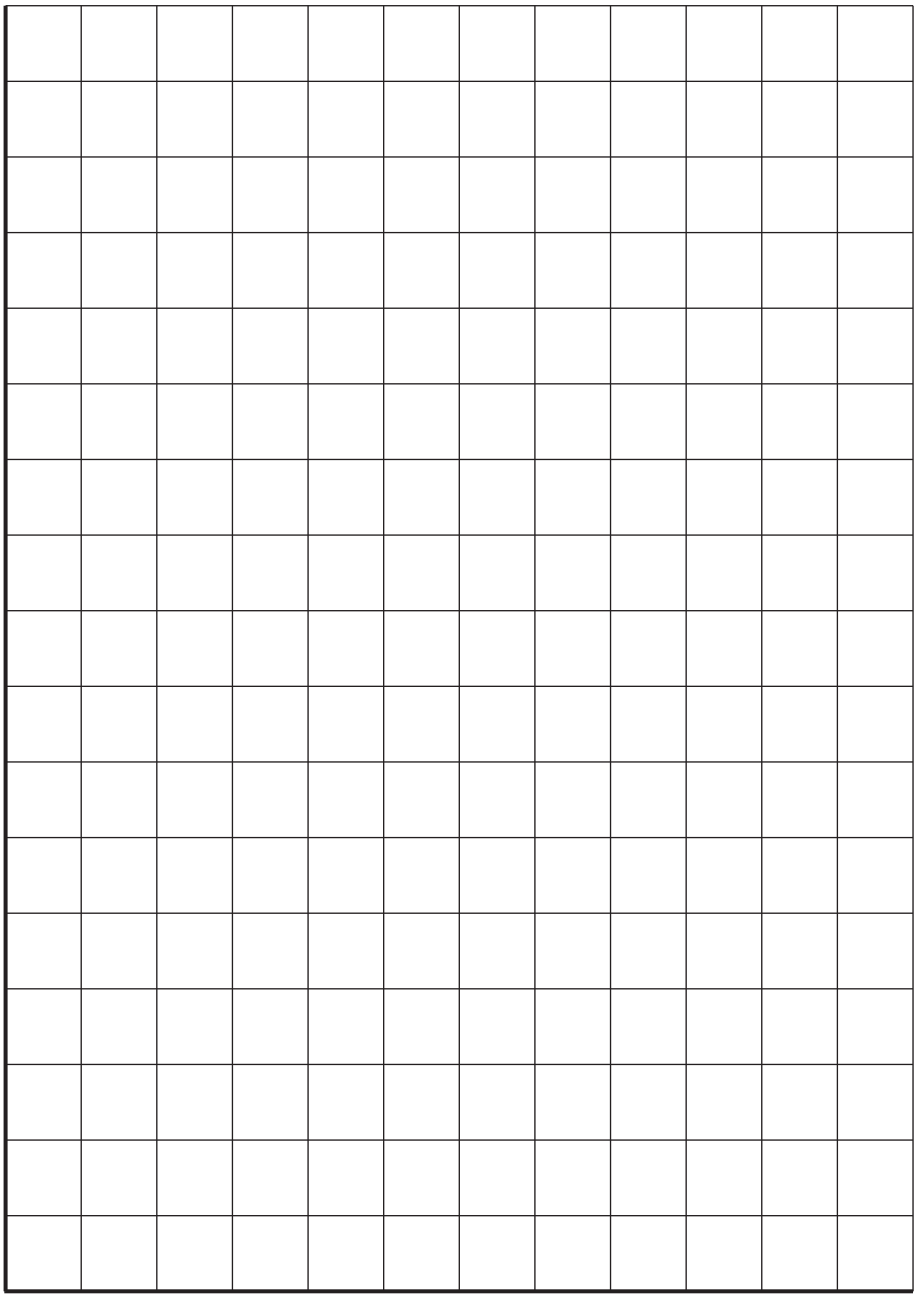

[6]

(b) Write down the mode.

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[1]

(c) Using these results, write down an estimate for the probability of choosing a red disc.

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[2]

Examiner only

5. Two overlapping rectangles, each 9 cm by 3 cm, are placed so as to make an L shape as shown in the diagram.

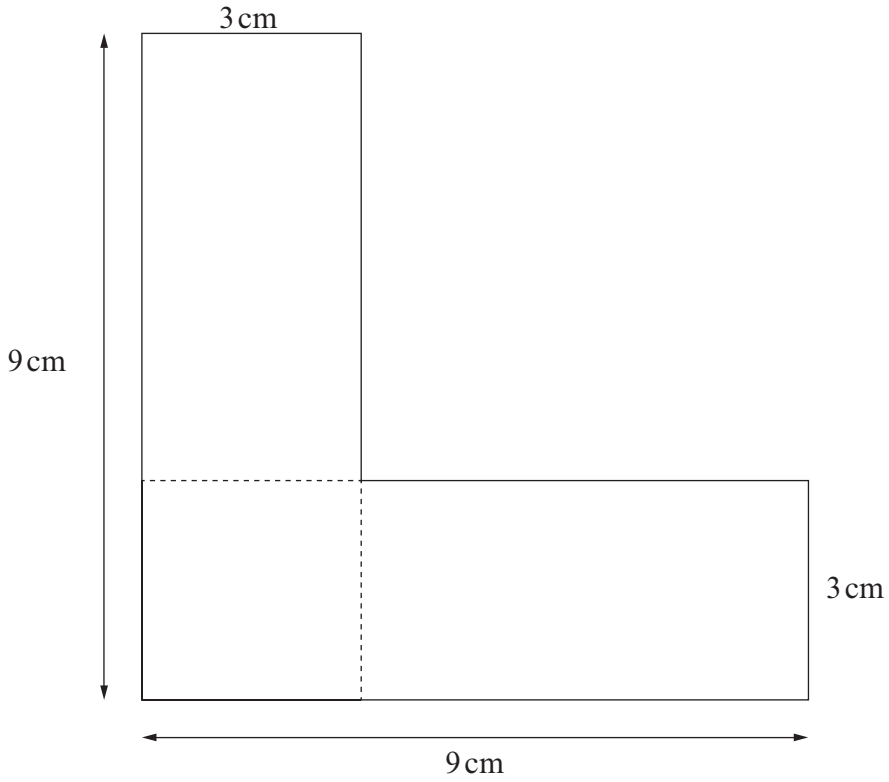

Diagram not drawn to scale

(a) Calculate the perimeter of the shape.

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[3]

(b) Calculate the area of the shape.
Write down the units of your answer.

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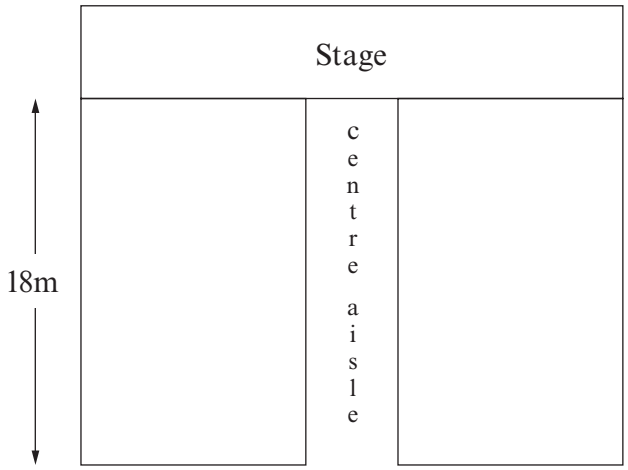
[3]

Examiner only

6. *You will be assessed on the quality of your written communication in this question.*

Year 10 pupils have been asked to arrange the seating for a concert in the school hall.
They work out that each row will have 12 seats on each side of the centre aisle.
Each row will take up 2 metres of the 18 metre length of the hall.
Showing all your working, decide whether or not there will be enough seats for 200 people.



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[6]

4370 030009

7. *(a)* Complete an accurate drawing of triangle PQR in which $PQ = 10\,\text{cm}$, $R\hat{P}Q = 36°$ and $R\hat{Q}P = 112°$.

The side PQ has been drawn for you.

[3]

(b) Write down the special name given to angles which are greater than 90°, but less than 180°.

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[1]

Examiner only

(c) Calculate the height of a cuboid of length 4 cm, width 3 cm and volume 84 cm^3.

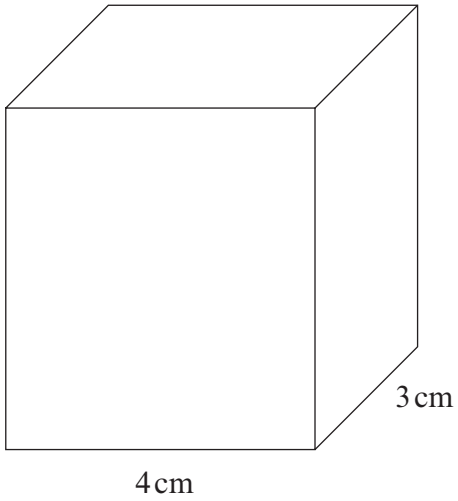

Diagram not drawn to scale

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[2]

Examiner only

8. The following table shows four places and their height above sea level.

Place	Height above sea level (in metres)
Llyn Cowlyd, Wales	355
Chott Melrhir, Algeria	–40
Lake Eyre, Australia	–15
The Fens, England	–4

(a) Explain what it means to write the height of Lake Eyre above sea level as –15.

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[1]

(b) Which place is the lowest of the four?

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[1]

(c) How much higher than Chott Melrhir is Llyn Cowlyd?

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[1]

Examiner only

9. There are four balls numbered 1, 3, 5 and 7 respectively in machine A and four balls numbered 2, 4, 6 and 8 respectively in machine B. In a game, both machines A and B select one ball at random.
The score for the game is the product of these two numbers.
For example, if the number on the ball from machine A is 3 and the number on the ball from machine B is 4, the score is 3×4 which is 12.

(a) Complete the following table to show all the possible scores.

Machine A \ Machine B	2	4	6	8
7	14	28	.....	.....
5	10	20	.....	.....
3	6	12	.....	.....
1	2	4	6	8

[2]

(b) A player wins a prize by getting a score of 12 or less.
It costs 80p to play the game once.
The prize for winning the game is £1.50.
If 160 people play the game once, find the expected profit.

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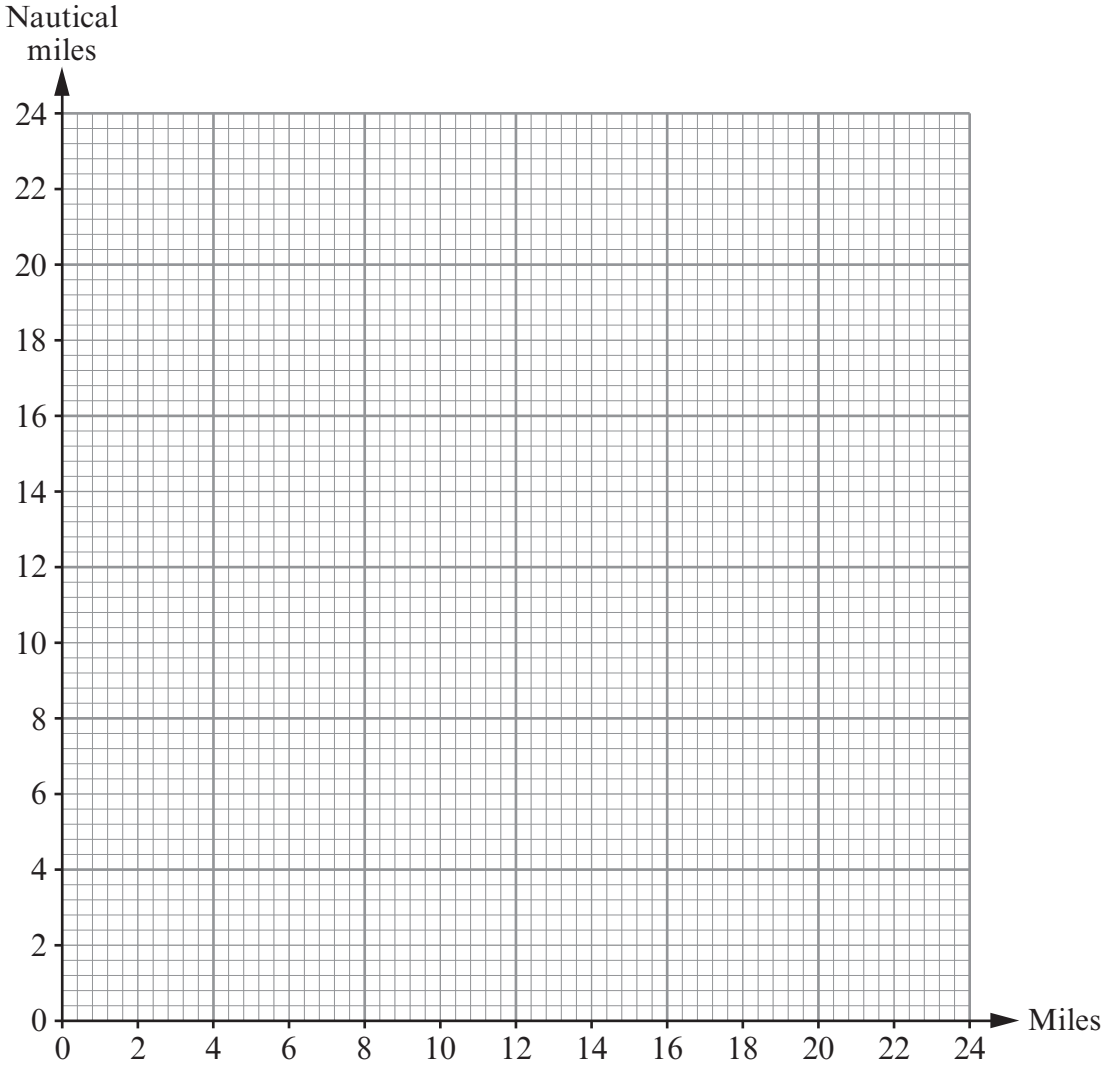
[6]

10. *(a)* At sea, the distance travelled by ships is measured in nautical miles rather than miles. The table shows the number of miles and the number of nautical miles for each of three distances.

Miles	8	16	23
Nautical miles	7	14	20

Use the data in the table to draw a conversion graph between miles and nautical miles.

[2]



(b) Find an estimate, in miles, for 50 nautical miles.

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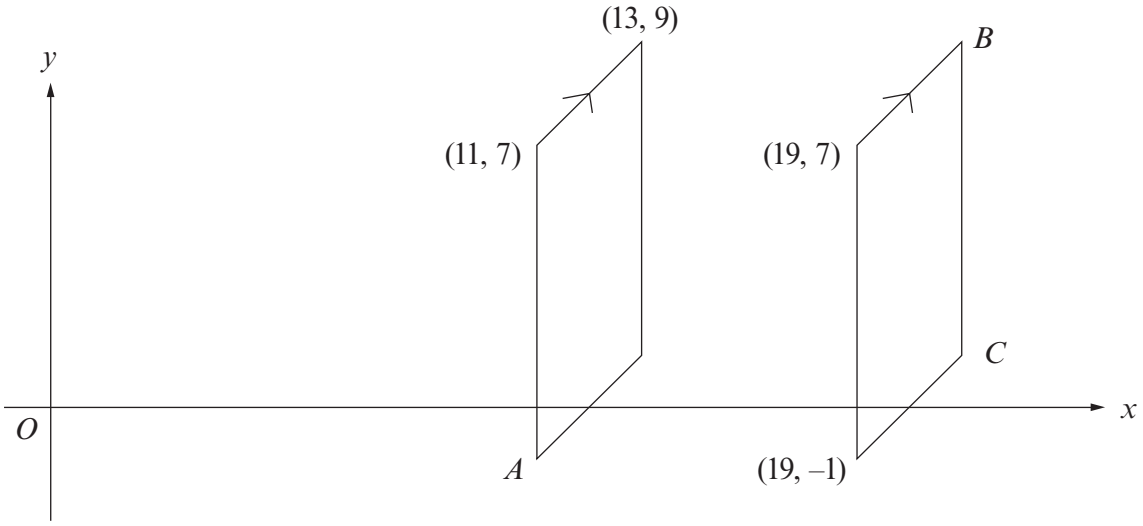
[2]

Examiner only

11. The diagram shows 2 identical parallelograms and the coordinates of four vertices. Find the coordinates of the vertices marked *A, B* and *C*.



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A (..... , ...) *B* (..... , ...) *C* (..... , ...)

[6]

Examiner only

12. Below are parts of two train time-tables.

Swansea to Bristol Parkway

Swansea	10:28	10:55	11:28	11:55
Neath	10:39	11:05	11:39	12:05
Port Talbot	10:47	11:12	11:47	12:12
Bridgend	10:59	11:25	11:59	12:25
Cardiff	11:22	11:47	12:22	12:47
Newport	11:39	12:08	12:39	13:08
Bristol Parkway	11:59	12:30	12:59	13:30

Bristol Parkway to Sheffield

Bristol Parkway	11:40	12:40	13:40	14:40
Cheltenham	12:10	13:12	14:10	15:11
Birmingham	13:03	13:58	14:56	15:59
Derby	13:42	14:40	15:39	16:40
Sheffield	14:17	15:18	16:17	17:19

(a) Sophie gets on the 10:55 from Swansea at Bridgend and gets off at Newport. How long should her journey take?

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[2]

(b) David lives in Port Talbot and needs to get to Birmingham by half past three in the afternoon.

(i) What is the latest train he can catch from Port Talbot to do this?

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[1]

(ii) How long should he have to wait at Bristol Parkway?

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[1]

Examiner only

(iii) On the day he travelled, owing to signal problems, the Swansea trains were 10 minutes late arriving at Bristol Parkway and the trains to Sheffield were 15 minutes late leaving Bristol Parkway.
Given that the trains kept to their normal speed, at what time did David arrive in Birmingham? Give a full explanation for your answer.

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[2]

Examiner only

13. *(a)* Express 140 as a product of prime numbers in index form.

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[3]

(b) The number 126 can be expressed as $2 \times 3^2 \times 7$. Using this fact and your answer to *(a)*, write down the Highest Common Factor (HCF) of the numbers 140 and 126.

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[1]

Examiner only

14. Enzo is given clues to help him solve a problem.

Clues:

- The shape is a polygon
- The shape has an odd number of sides
- The shape is not a triangle
- The shape has fewer than 7 sides
- Three of the interior angles each measure 106°
- All the other angles are marked with the letter x

Solve Enzo's problem to find the size of x.

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[6]

Examiner only

15.

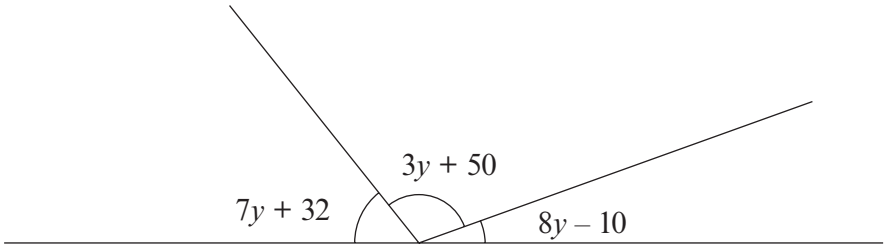

Diagram not drawn to scale

All of the angles are measured in degrees.
Find the size of each of the three angles.

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$7y + 32 =$ ..... ° $3y + 50 =$ ..... ° $8y - 10 =$ ..... °

[5]

Examiner only

16. *(a)* Expand $y(y^3 + 6)$.

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[2]

(b) Solve $\frac{x}{3} + 54 = 63$.

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[2]

(c) Write down the nth term of the sequence 3, 7, 11, 15, 19, ...

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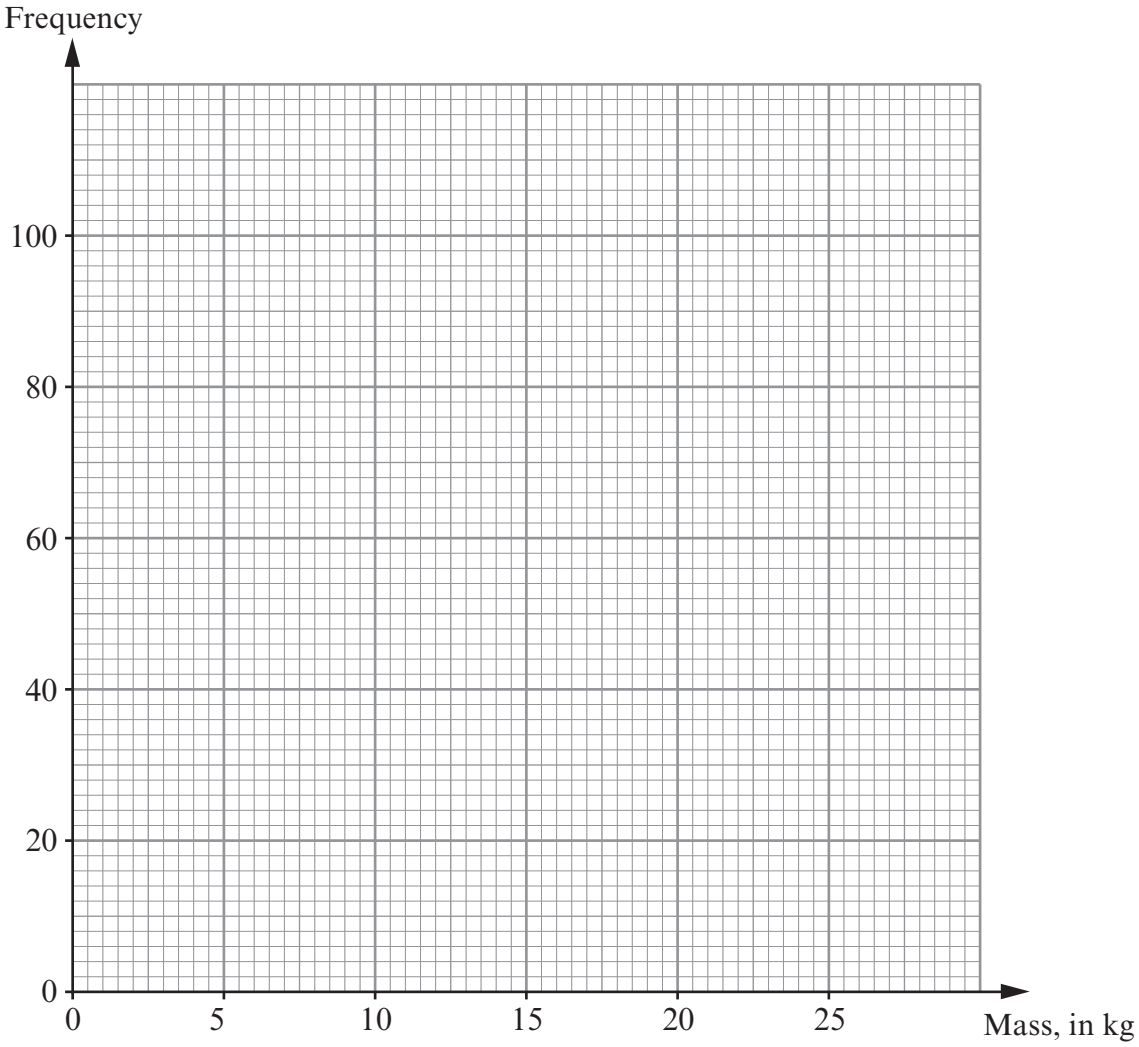
[2]

17. The total mass of tomatoes, in kg, produced by each of 200 plants in a greenhouse was measured.
The table shows the grouped frequency distribution for the total mass of tomatoes on each of these 200 plants.

Mass, x kg	$0 < x \leqslant 5$	$5 < x \leqslant 10$	$10 < x \leqslant 15$	$15 < x \leqslant 20$	$20 < x \leqslant 25$
Frequency	6	20	70	88	16

(a) On the graph paper below, draw a frequency diagram to show this data.

[2]



(b) State which class interval contains the median.

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[1]

Question number	Additional page, if required. Write the question numbers in the left-hand margin

Examiner only