



THIRD SPACE  
LEARNING

# Mathematics

## Paper 1

### (Non-Calculator)

## Higher Tier

Edexcel GCSE

SET 3

# Mathematics Paper 1 (Non-Calculator) Higher Tier Edexcel

## GCSE SET 3

Name

Total marks



Paper length: 1hr 30mins

### Instructions

- Use black ink or ball-point pen.
- Fill in the boxes at the top of this page with your name, centre number and candidate number.
- Answer all questions.
- Answer the questions in the spaces provided – there may be more space than you need.
- You must show all your working.
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- Calculators may not be used.

### Information

- The total mark for this paper is 80
- The marks for each question are shown in brackets – use this as a guide as to how much time to spend on each question.

Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
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10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	

### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

This practice paper is based on the topics from the **advanced information for the November 2024 exam series**.

*Please note, this practice paper is an example to help revision, these topics can be tested in other ways and other topics may be included in the actual papers*

- 1** Write 208 as a product of its prime factors.

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**(Total for Question 1 is 2 marks)**

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- 2** Work out  $2\frac{1}{4} \times 1\frac{2}{3}$ .

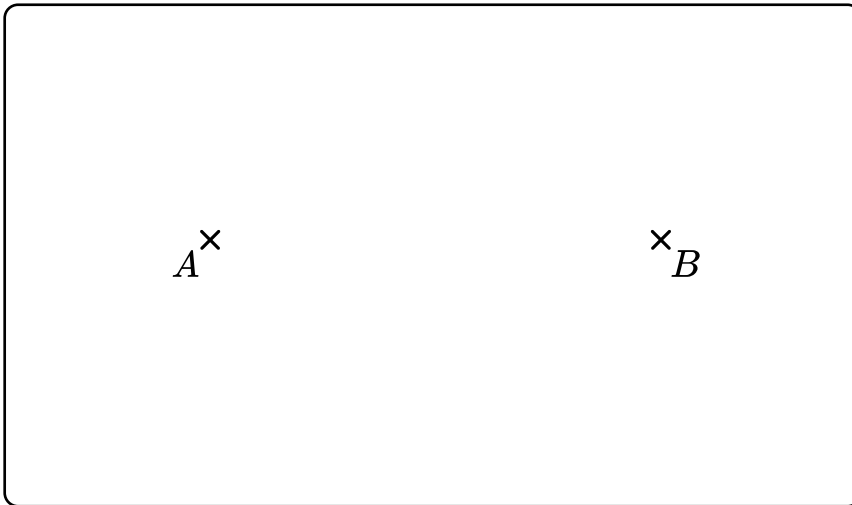
Give your answer as a mixed number in its simplest form.

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**(Total for Question 2 is 3 marks)**

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- 3 The diagram shows the position of two phone masts.

The scale of the diagram is  $1\text{ cm}$  represents  $20\text{ m}$ .



Lydia lives near two phone masts,  $A$  and  $B$ .

Lydia lives closer to mast  $A$  than mast  $B$ , but still within  $80\text{ m}$  of mast  $B$ .

On the diagram, shade the area where Lydia could live.

**(Total for Question 3 is 3 marks)**

- 4 Stacey buys 300 glow sticks for £40.  
Stacey sells all of the glow sticks. She charges 50p for 3 glow sticks.  
Calculate Stacey's percentage profit.

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(Total for Question 4 is 4 marks)

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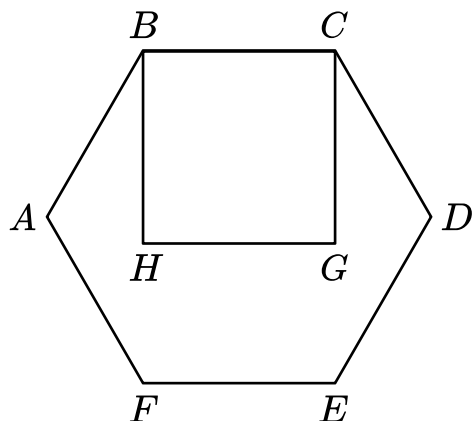
- 5 Write these numbers in order of size.  
Start with the smallest.

$3.65 \times 10^5$       365       $36.5 \times 10^{-2}$       0.0365

-----  
(Total for Question 5 is 2 marks)

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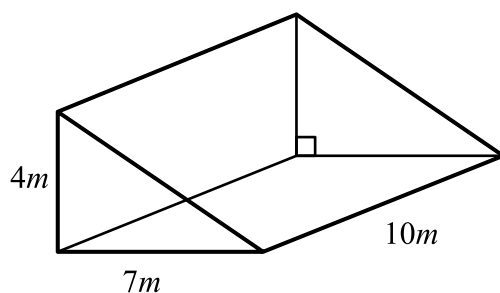
- 6  $ABCDEF$  is a regular hexagon.  
 $BCGH$  is a square.



Show that  $\text{angle } BHG = 3 \times \text{angle } ABH$ .

(Total for Question 6 is 4 marks)

7 Here is a triangular prism.



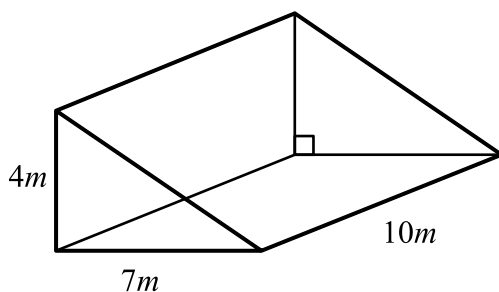
(a) Work out the volume of the prism.

-----  $m^3$

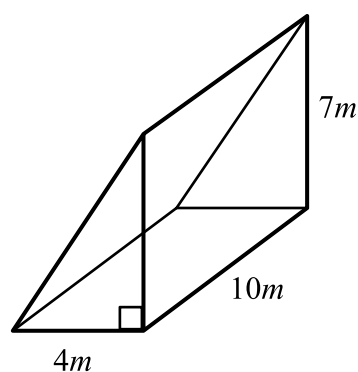
(2)

(b) The pressure on the table due to the prism, in its original position, is  $60 \text{ N/m}^2$ . The prism is rotated  $90^\circ$ , as shown.

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$



Original position



New position

Work out the pressure on the table after the prism has been rotated.

-----  $\text{N/m}^2$

(3)

**(Total for Question 7 is 5 marks)**

8 In a football team there are 6 boys and 4 girls. The mean height of the boys is 130*cm* and the mean height of the girls is 120*cm*.

Tiami says the mean height of all the players is 126*cm*.

Is Tiami correct?

You must show how you get your answer.

(Total for Question 8 is 3 marks)

9 Complete the table for these sequences.

Sequence	1st term	2nd term	3rd term	4th term	5th term	<i>n</i> th term
A	3	7	11	15		
B	1	4	9	16		
C	$\frac{1}{3}$	1	3	9	27	
D	$\frac{2}{3}$	3	6	7	-2	

(Total for Question 9 is 4 marks)



**10** (a) Simplify  $3p^2q \times 4p^3q^2$

-----  
(2)

(b) Given  $a = 4b^3$  and  $b = 2m^2$ , write an expression for  $a$  in terms of  $m$ .

Give your answer in its simplest form.

$a =$  -----  
(2)

(c) Write  $\sqrt{32} \times \frac{1}{2^2}$  as a single power of 2

-----  
(3)

**(Total for Question 10 is 7 marks)**

- 11 The table shows information about the ages of 80 trees in a national park.

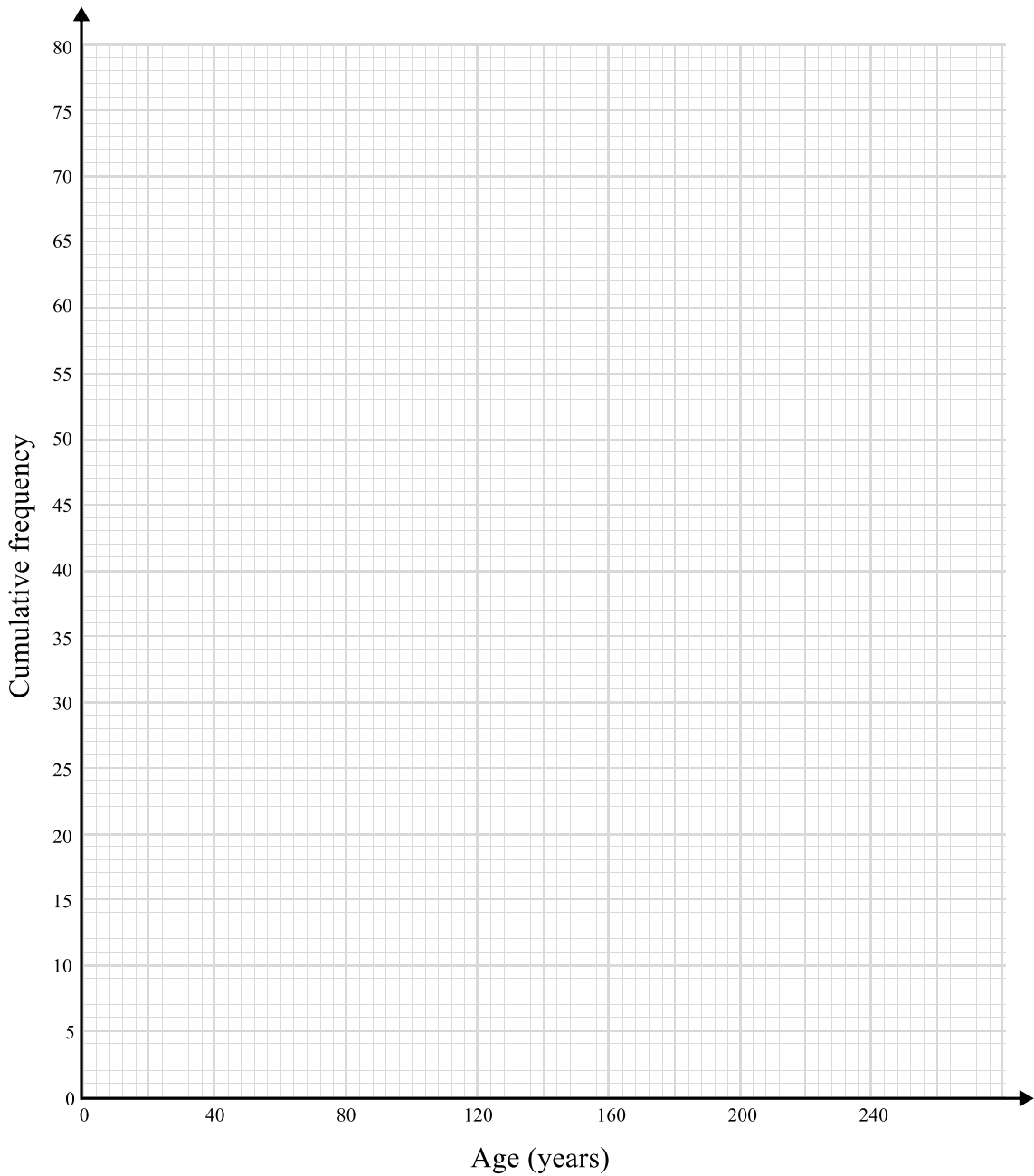
Age ( $A$ years)	Frequency
$0 < A \leq 40$	13
$40 < A \leq 80$	28
$80 < A \leq 120$	23
$120 < A \leq 160$	9
$160 < A \leq 200$	5
$200 < A \leq 240$	2

- (a) Complete the cumulative frequency table.

Age ( $A$ years)	Cumulative frequency
$0 < A \leq 40$	
$0 < A \leq 80$	
$0 < A \leq 120$	
$0 < A \leq 160$	
$0 < A \leq 200$	
$0 < A \leq 240$	

(1)

(b) On the grid below, draw a cumulative frequency graph for your completed table.



(2)

(c) One tree is picked at random. Use your graph to find an estimate for the probability that the tree is over 100 years old.

(3)

(Total for Question 11 is 6 marks)

- 12** In a football season, Player  $J$  scored 28 goals from 36 shots, player  $K$  scored 22 goals from 40 shots and Player  $L$  scored 16 goals from 30 shots.

Player  $J$ 's success rate is  $\frac{28}{36}$ .

Write the success rate of each player in the ratio  $J:K:L$ , where each value is an integer.

Give your answer in its simplest form.

-----  
**(Total for Question 12 is 3 marks)**

**13** Express  $0.4\dot{3}\dot{5}$  as a fraction.

You must show all your working.

-----  
**(Total for Question 13 is 3 marks)**

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**14** Given that  $6\sin(30) \times 2\cos(30) = a\sqrt{3}$ , find the value of  $a$ .

$a =$  -----

**(Total for Question 14 is 3 marks)**

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**15** The probability that Olivia walks to school is 0.6.

When Olivia doesn't walk, she gets the bus.

When Olivia walks to school, the probability that she is late is 0.4.

When Olivia gets the bus, the probability that she is late is 0.1.

Find the probability that, on any one day, Olivia is late for school.

-----  
**(Total for Question 15 is 4 marks)**

**16**  $P$  is inversely proportional to the square of  $Q$ .

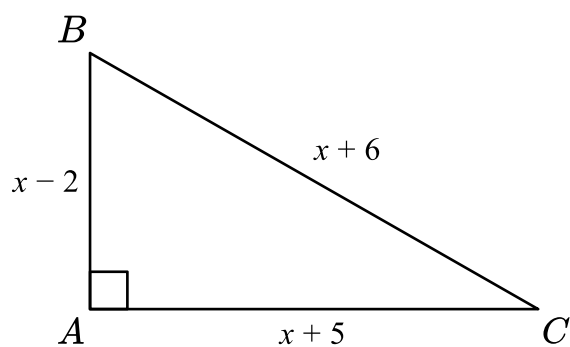
$P = 1.5$  when  $Q = 10$ .

Find the value of  $P$  when  $Q = 5$

$P =$  \_\_\_\_\_

**(Total for Question 16 is 3 marks)**

**17**  $ABC$  is a right-angled triangle.

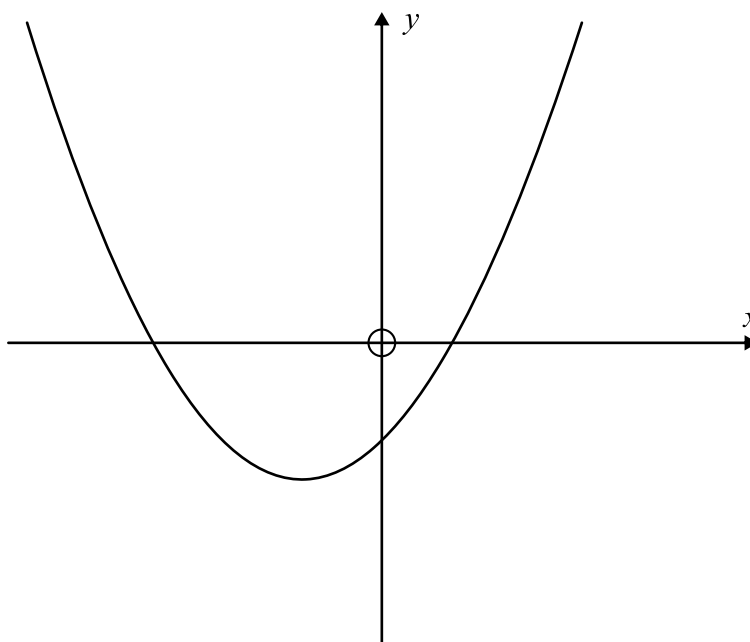


Form an equation in  $x$  and use it to work out the value of  $x$ .

$x =$  \_\_\_\_\_

**(Total for Question 17 is 4 marks)**

**18** Here is a sketch of a curve.



The equation of the curve is  $y = x^2 + ax + b$  where  $a$  and  $b$  are integers.

The points  $(0, -6)$  and  $(1, 0)$  lie on the curve.

Find the coordinates of the turning point of the curve.

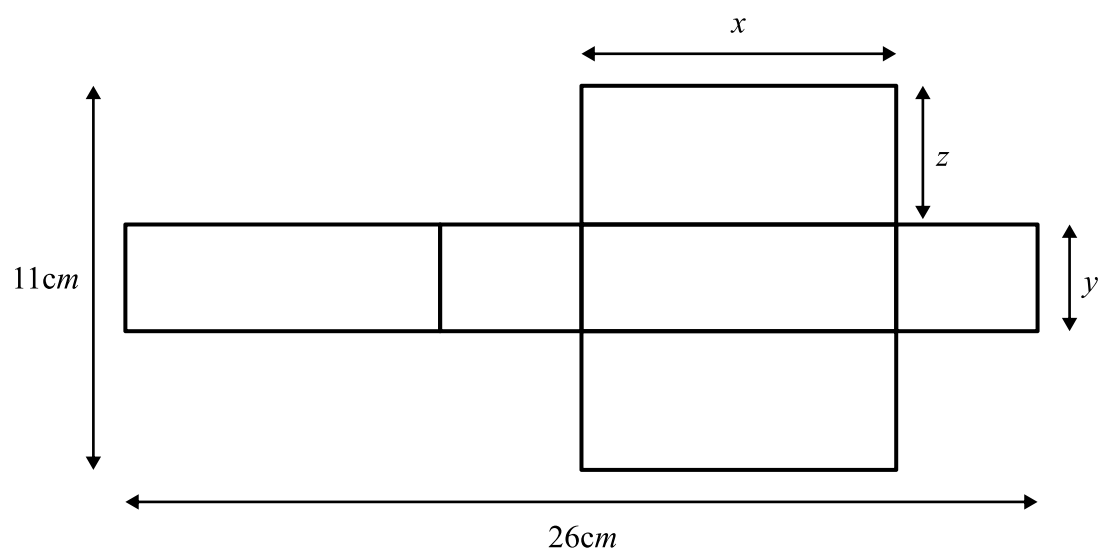
( \_\_\_\_\_ , \_\_\_\_\_ )

**(Total for Question 18 is 4 marks)**



- 19 A cuboid has length  $x$  cm, width  $y$  cm and height  $z$  cm.

Here is a net of the cuboid.



The ratio  $x:y = 3:1$ .

Find the value of  $x$ , the value of  $y$ , and the value of  $z$ .

$x =$  \_\_\_\_\_  $cm$

$y =$  \_\_\_\_\_  $cm$

$z =$  \_\_\_\_\_  $cm$

**(Total for Question 19 is 5 marks)**

**20**  $a = \sqrt{90}$

$b = 2 + \sqrt{10}$

$M = \frac{a}{b}$

Work out the value of  $M$ .

Give your answer in the form  $a - \sqrt{b}$  where  $a$  and  $b$  are integers.

-----  
**(Total for Question 20 is 4 marks)**

- 21** A rectangle has height  $h$  and base  $b$ . The area of the rectangle is  $54\text{cm}^2$  and the perimeter of the rectangle is  $33\text{cm}$ .

(a) Show that  $h = \frac{54}{b}$

-----  
(1)

- (b) Work out the height and base of the rectangle.

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(3)

**(Total for Question 21 is 4 marks)**

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