



THIRD SPACE  
LEARNING

# Mathematics

## Paper 5

### (Non-Calculator)

### Higher Tier

OCR GCSE

SET 3


# Mathematics Paper 5 (Non-Calculator) Higher Tier OCR

## GCSE SET 3

Name

Total marks

Paper length: 1hr 30mins



Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	

### 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 100
- The marks for each question are shown in brackets – use this as a guide as to how much time to spend on each question.

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

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

----- [3]

- 2 (a) Complete this statement by writing the missing power in the box.

$$208 = 2^{\square} \times 13$$

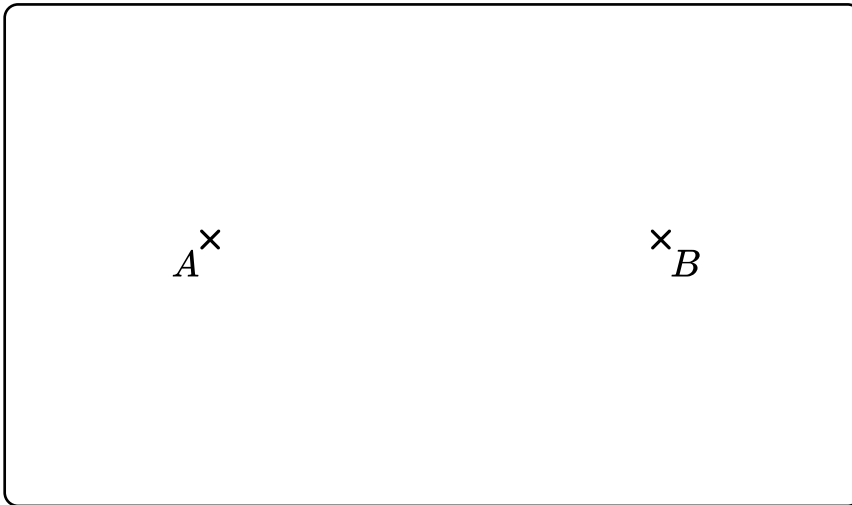
[1]

- (b) Find the highest common factor of 208 and 78.

(b) ----- [3]

- 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 between 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.

[3]

- 
- 4 Gwion has a 2 litre bottle of milk. Each day, Gwion uses 240 millilitres of milk.

Gwion says that after 6 days he will have used over 75% of the milk.

Is Gwion correct?

Show how you decide.

----- [4]



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

----- **[4]**

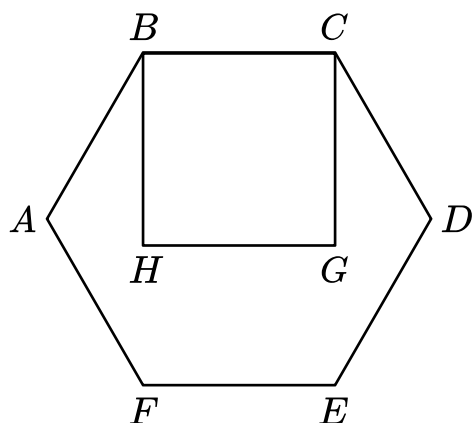
- 6** Write these numbers in order of size.  
Start with the smallest.

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

----- **[2]**

7  $ABCDEF$  is a regular hexagon.

$BCGH$  is a square.



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

[4]

- 8 (a) A cube, with side length  $10.1\text{ cm}$ , has a mass of  $594\text{ g}$ .

Work out an estimate of the density, in  $\text{g/cm}^3$ , of the cube.

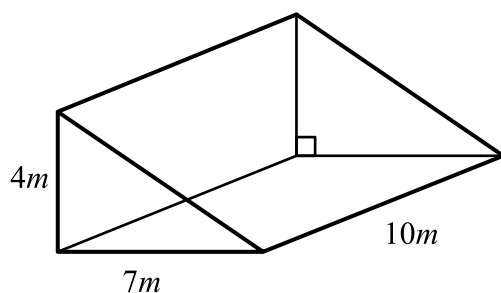
The formula for density is:  $\left[ \text{Density} = \frac{\text{Mass}}{\text{Volume}} \right]$

(a) .....  $\text{g/cm}^3$  [4]

- (b) Is your estimate an underestimate or an overestimate?

(b) ..... [1]

9 Here is a triangular prism.

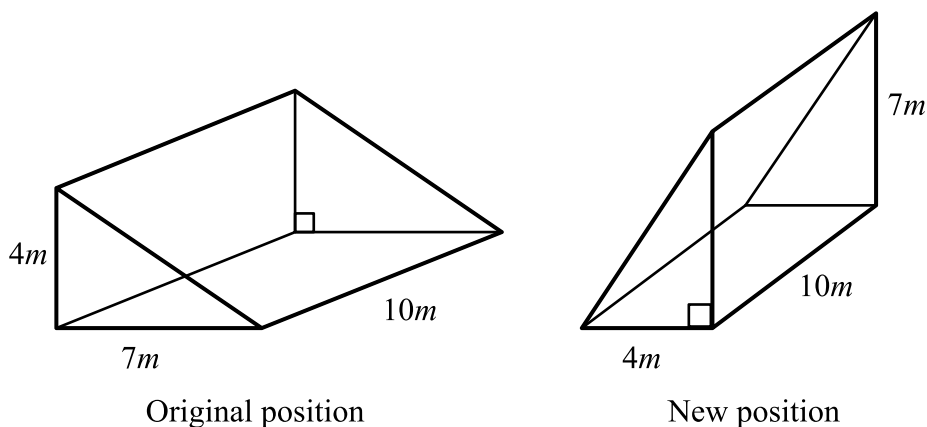


(a) Work out the volume of the prism.

(a) .....  $m^3$  [2]

(b) The pressure on the table due to the prism is  $60 \text{ newtons/m}^2$ .

The prism is rotated  $90^\circ$ , as shown.



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

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

(b) .....  $\text{newtons/m}^2$  [3]

- 10** In a football team there are 6 boys and 4 girls.

The mean height of the boys is  $130\text{cm}$  and the mean height of the girls is  $120\text{cm}$ .

Tiami says the mean height of all of the players is  $126\text{cm}$ .

Is Tiami correct?

You must show how you get your answer.

..... [3]

---

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

(a) ..... [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.

(b)  $a =$  ..... [2]

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

(c) ..... [3]

---

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

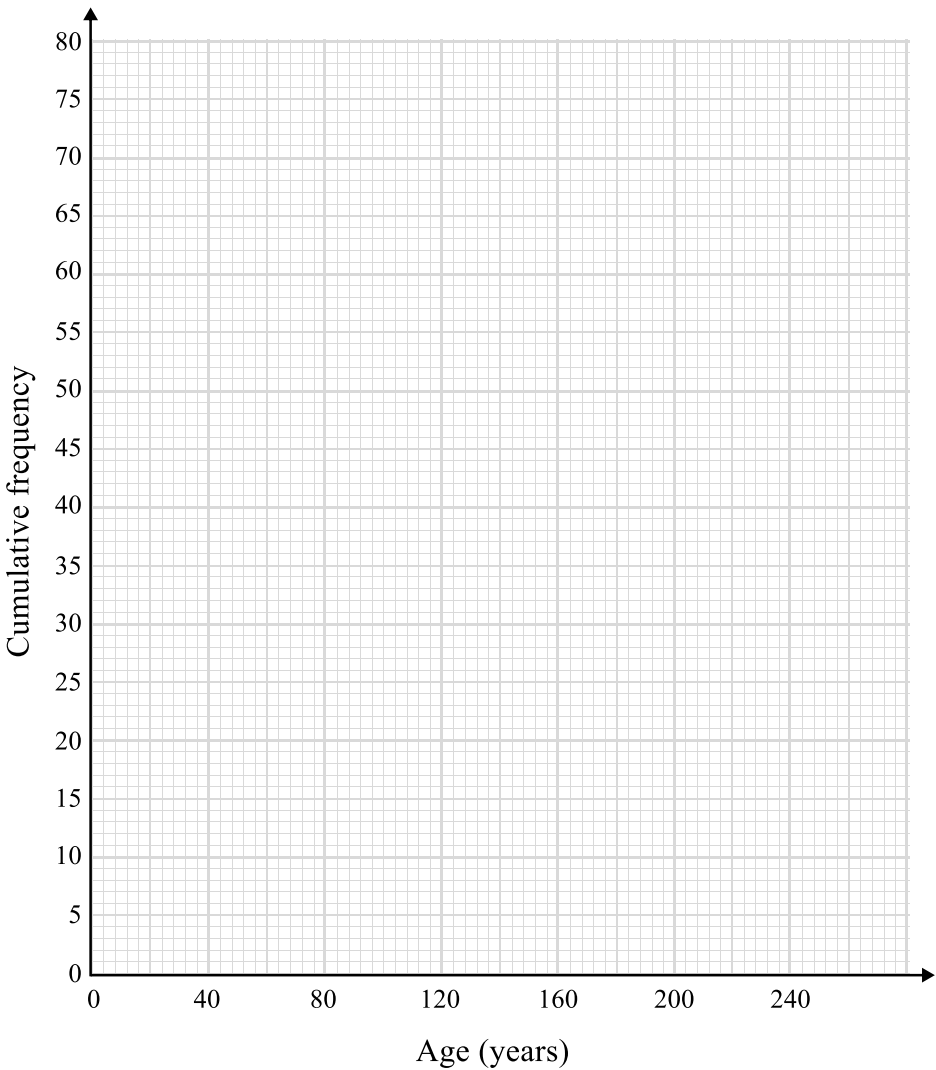
Age ( $A$ years)	Frequency
$0 < A \leq 40$	13
$40 < A \leq 80$	28
$80 < A \leq 120$	23
$120 < A \leq 160$	9
$160 < A \leq 200$	5
$200 < A \leq 240$	2

- (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 opposite, 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.

(c) ..... [3]

- 13** 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.

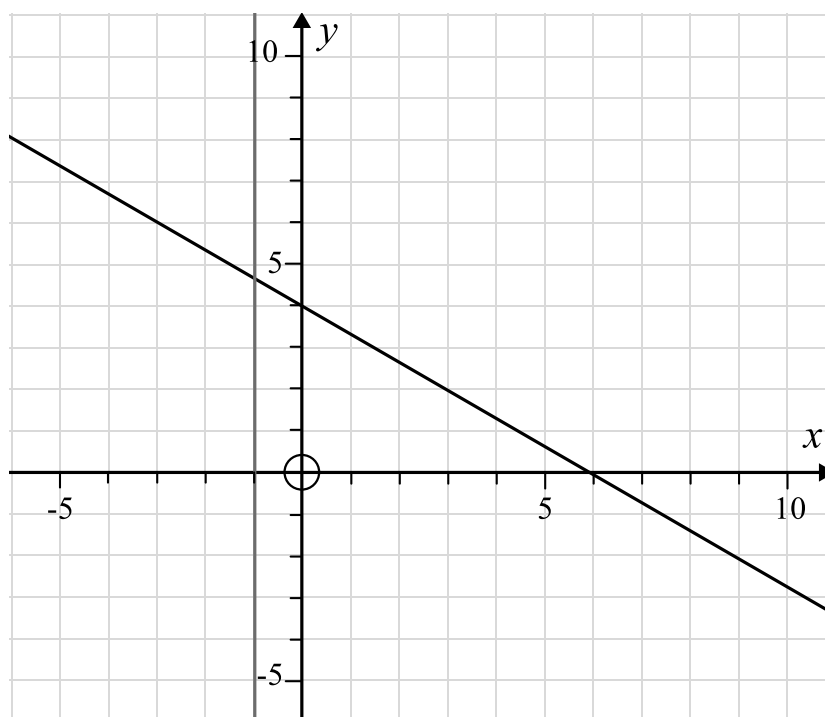
Player  $J$ 's success rate is  $\frac{28}{36}$ .

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.

----- [3]



- 14 The graphs of  $2x + 3y = 12$  and  $x = -1$  are shown on the grid below.



The region  $R$  satisfies the following inequalities.

$$x \geq -1 \qquad y > x \qquad 2x + 3y \leq 12$$

By drawing one more line, find and label the region  $R$ .

[5]

**15** (a) Express  $\frac{5}{6}$  as a recurring decimal.

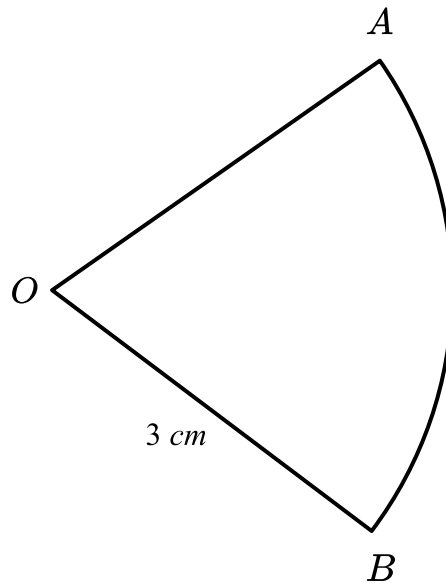
**(a)** ..... **[2]**

(b) Express  $0.4\dot{3}\dot{5}$  as a fraction.

You must show all your working.

**(b)** ..... **[3]**

16  $AOB$  is a sector of a circle, centre  $O$  and radius  $3\text{ cm}$ .



The area of the sector is  $2\pi\text{ cm}^2$ .

Find the perimeter of the sector.

Give your answer in the form  $a + b\pi$ .

You must show your working.

.....  $\text{cm}$  [6]

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

$a =$  ..... [3]

---

18 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.

[4]

- 19  $P$  is inversely proportional to the square of  $Q$ .

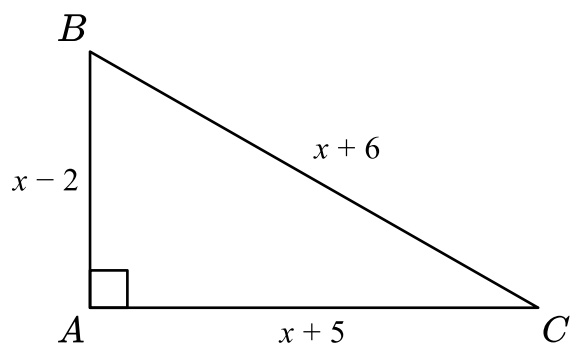
$$P = 1.5 \text{ when } Q = 10.$$

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

$$P = \text{-----} [3]$$

---

- 20  $ABC$  is a right-angled triangle.

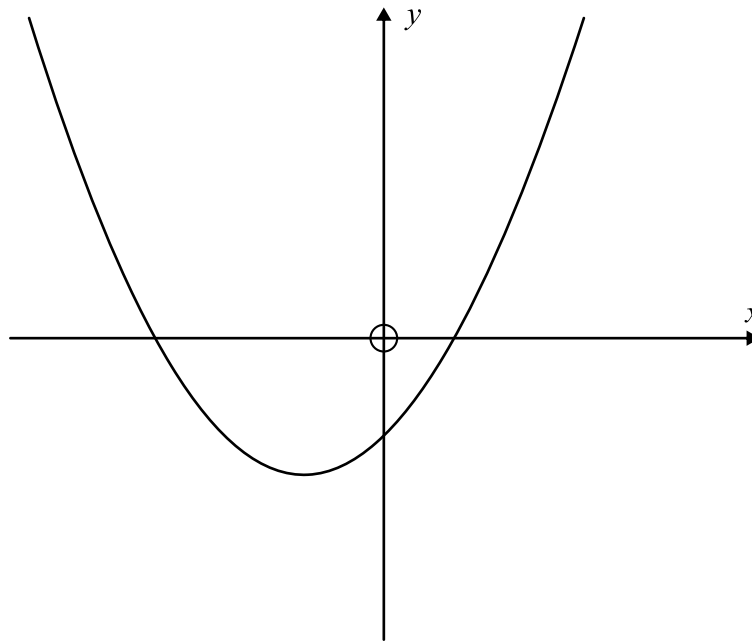


Form an equation in  $x$  and use it to work out the value of  $x$ .

$$x = \text{-----} [4]$$

---

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



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

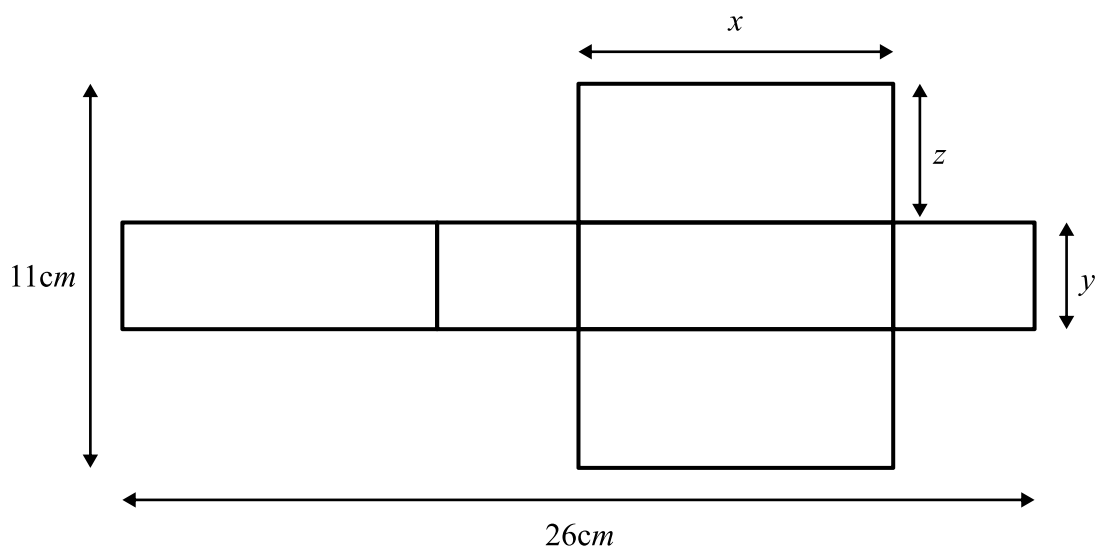
The points  $(0, -6)$  and  $(1, 0)$  lie on the curve.

Find the coordinates of the turning point of the curve.

( ..... , ..... ) [4]

- 22** 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  $z$ .

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

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

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

**[5]**

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

$b = 2 + \sqrt{10}$

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

Work out the value of  $M$ .

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

----- **[4]**



- 24** 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.

**(b)** ..... **[3]**

# Help ease the pressure with a personalised revision programme for each of your target KS4 students

Our one to one GCSE revision programme is designed to help your target students reach their potential in their GCSE maths exams.

Our specialist maths tutors work one to one with each student, focusing on securing core KS4 content and building familiarity with the kinds of questions they'll be tackling in their GCSE exams.

Get in touch today:

✉ [hello@thirdspacelearning.com](mailto:hello@thirdspacelearning.com)

🔍 [thirdspacelearning.com](https://thirdspacelearning.com)

☎ 0203 771 0095