



THIRD SPACE  
LEARNING

# Mathematics

## Paper 1

### (Non-Calculator)

## Higher Tier

AQA GCSE

SET 2

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

## GCSE SET 2

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.

## 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.

*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 Circle the fraction that is equivalent to 3.125

[1 mark]

$$\frac{25}{8}$$

$$\frac{27}{8}$$

$$\frac{31}{8}$$

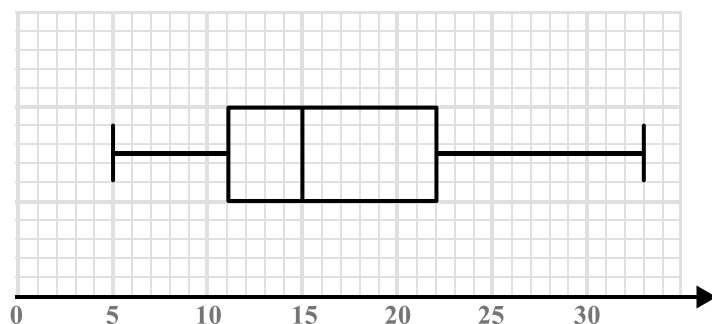
$$\frac{125}{4}$$

- 2 Here is a box plot.

Work out the interquartile range of this set of data.

Circle your answer.

[1 mark]



28

15

11

22

- 3 A is (3, 8) and B is (-1, 2).

Circle the midpoint of AB.

[1 mark]

(2, 5)

(2, 3)

(1, 5)

(1, 3)

- 4 The lowest common multiple of two numbers is 24.

One of the numbers is 6.

Circle the other possible number.

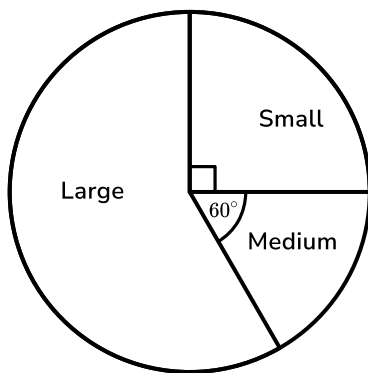
[1 mark]

4            8            12            16

- 5 Lily has a bag of 60 marbles.

There are three different sizes of marbles.

The pie chart shows information about the size of the marbles.



Small marbles weigh 2.1g.

Medium marbles weigh 3.5g.

Large marbles weigh 4g.

Work out the total weight of the marbles in Lily's bag.

[4 marks]

---

---

---

---

---

Answer \_\_\_\_\_ g

6 You are given that  $2a + 3b = 0.35$

Write  $4a + 6b$  as a fraction in its simplest form.

[2 marks]

---

---

---

---

---

Answer \_\_\_\_\_

7(a) Write  $38 \times 10^3$  in standard form.

[1 mark]

---

---

Answer \_\_\_\_\_

7(b)  $2.62 \times 10^p + 4.1 \times 10^q = 262.41$

Write down the values of  $p$  and  $q$ .

[2 marks]

---

---

$p =$  \_\_\_\_\_

$q =$  \_\_\_\_\_

**8** Oscar has designed a game.

Oscar has a set of 10 cards, numbered 1 to 10.

A player wins the game if they pick a card that is a prime number.

Olivia picks one card.

**8(a)** Find the probability that Olivia wins.

**[2 marks]**

---

---

Answer \_\_\_\_\_

Oscar will charge 50p to play the game.

The prize for winning is £1.

200 people play the game.

**8(b)** Work out an estimate for the amount of money Oscar will make.

**[3 marks]**

---

---

---

---

£ \_\_\_\_\_

**9** The second and third terms of a geometric progression are shown.

.....      2      8

Work out the first term of the sequence.

**[1 mark]**

---

---

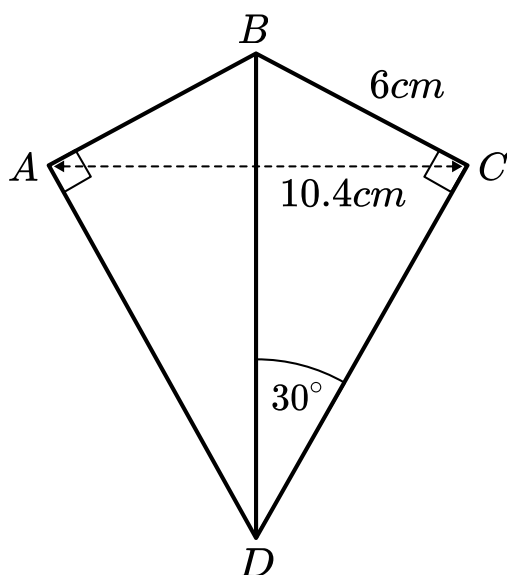
Answer \_\_\_\_\_

**10(a)** Write down the exact value of  $\sin 30$

**[1 mark]**

Answer \_\_\_\_\_

**10(b)** ABCD is a kite.



$$BC = 6\text{cm}$$

$$AC = 10.4\text{cm}$$

Work out the area of ABCD.

**[4 marks]**

---

---

---

---

---

---

---

Answer \_\_\_\_\_

- 11 Given that  $\frac{a}{b} = 7$  and  $\frac{b}{c} = 5$ , find an expression for  $a$  in terms of  $c$ .

[2 marks]

---

---

---

---

Answer \_\_\_\_\_

- 12(a) Write down the value of  $11^0$

[1 mark]

Answer \_\_\_\_\_

- 12(b) Find the value of  $125^{\frac{2}{3}}$

[2 marks]

---

---

Answer \_\_\_\_\_

- 12(c) Find the value of  $3^{-2}$

[1 mark]

---

---

Answer \_\_\_\_\_



- 13** The table gives information about the amount of money spent by the first 80 customers to visit a shop on Saturday.

Amount spent (£s)	Frequency
$0 \leq s < 20$	8
$20 \leq s < 40$	12
$40 \leq s < 60$	19
$60 \leq s < 80$	17
$80 \leq s < 100$	13
$100 \leq s < 120$	11

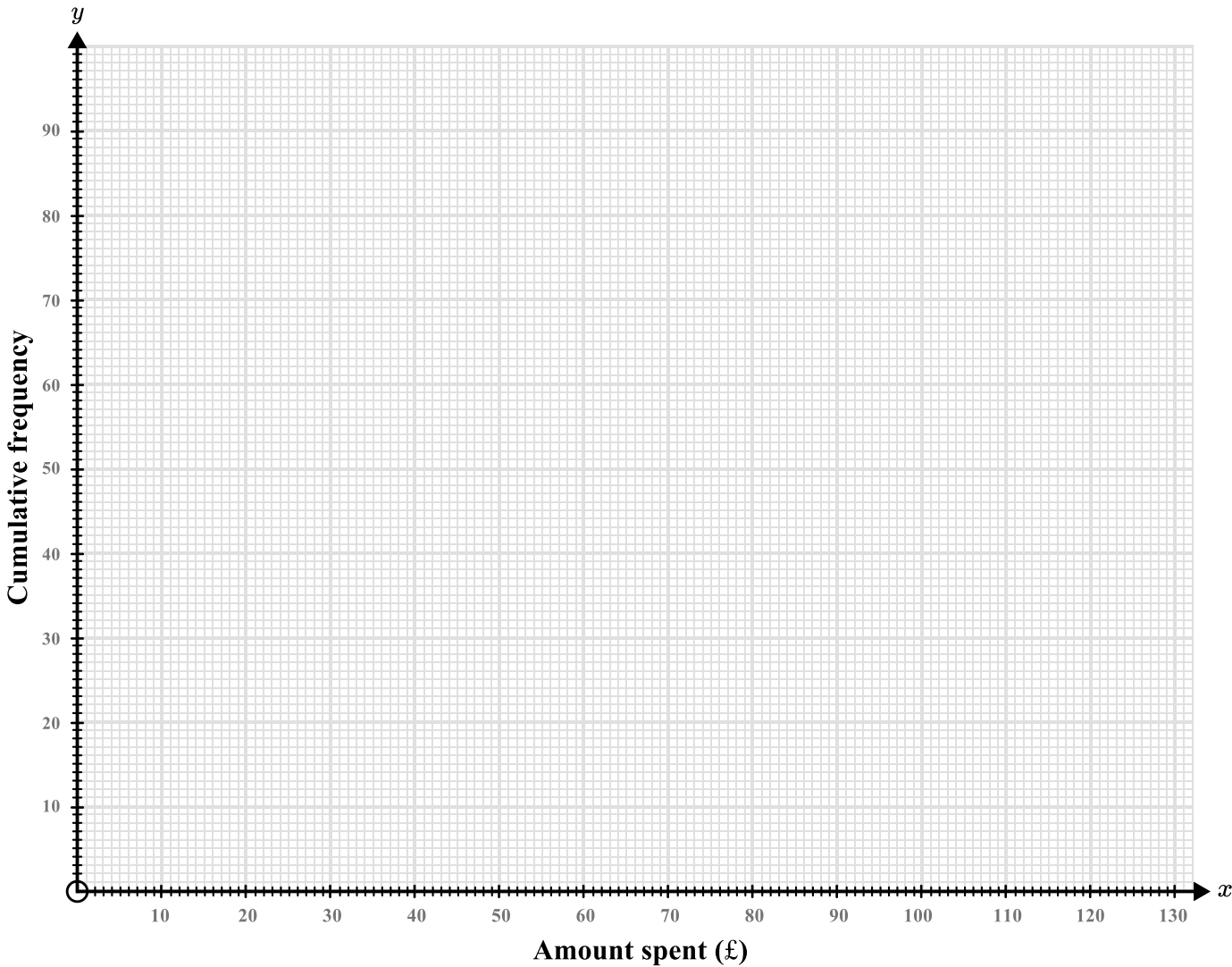
- 13(a)** Complete the cumulative frequency table.

**[1 mark]**

Amount spent (£s)	Cumulative frequency
$0 \leq s < 20$	
$0 \leq s < 40$	
$0 \leq s < 60$	
$0 \leq s < 80$	
$0 \leq s < 100$	
$0 \leq s < 120$	

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

[2 marks]



13(c) On Sunday, the median spend of the first 80 customers was £25.  
Compare this to the median spend of the first 80 customers on Saturday.

[2 marks]

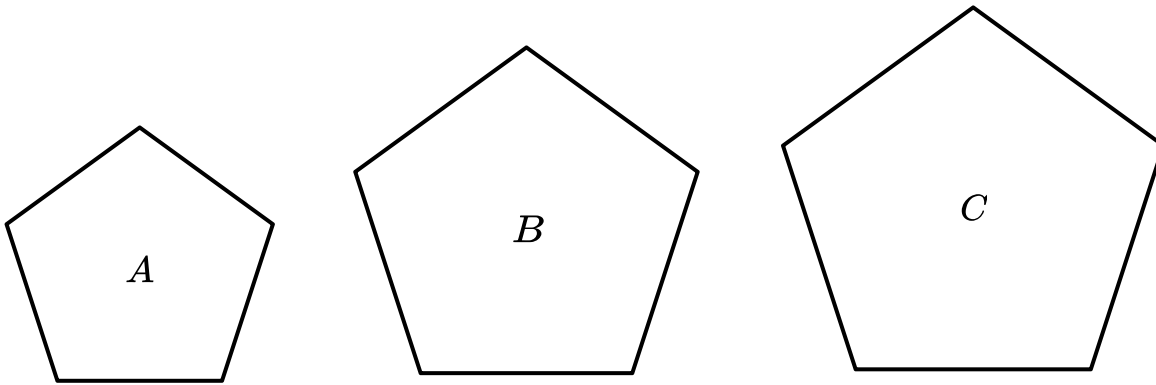
---

---

---

---

14 Here are three pentagons.



The area of pentagon B is 50% greater than the area of pentagon A.

The area of pentagon C is 40% greater than the area of pentagon B.

Write down the ratio of  
area of A : area of B : area of C.

Give your answer in its simplest form.

[4 marks]

---

---

---

---

---

---

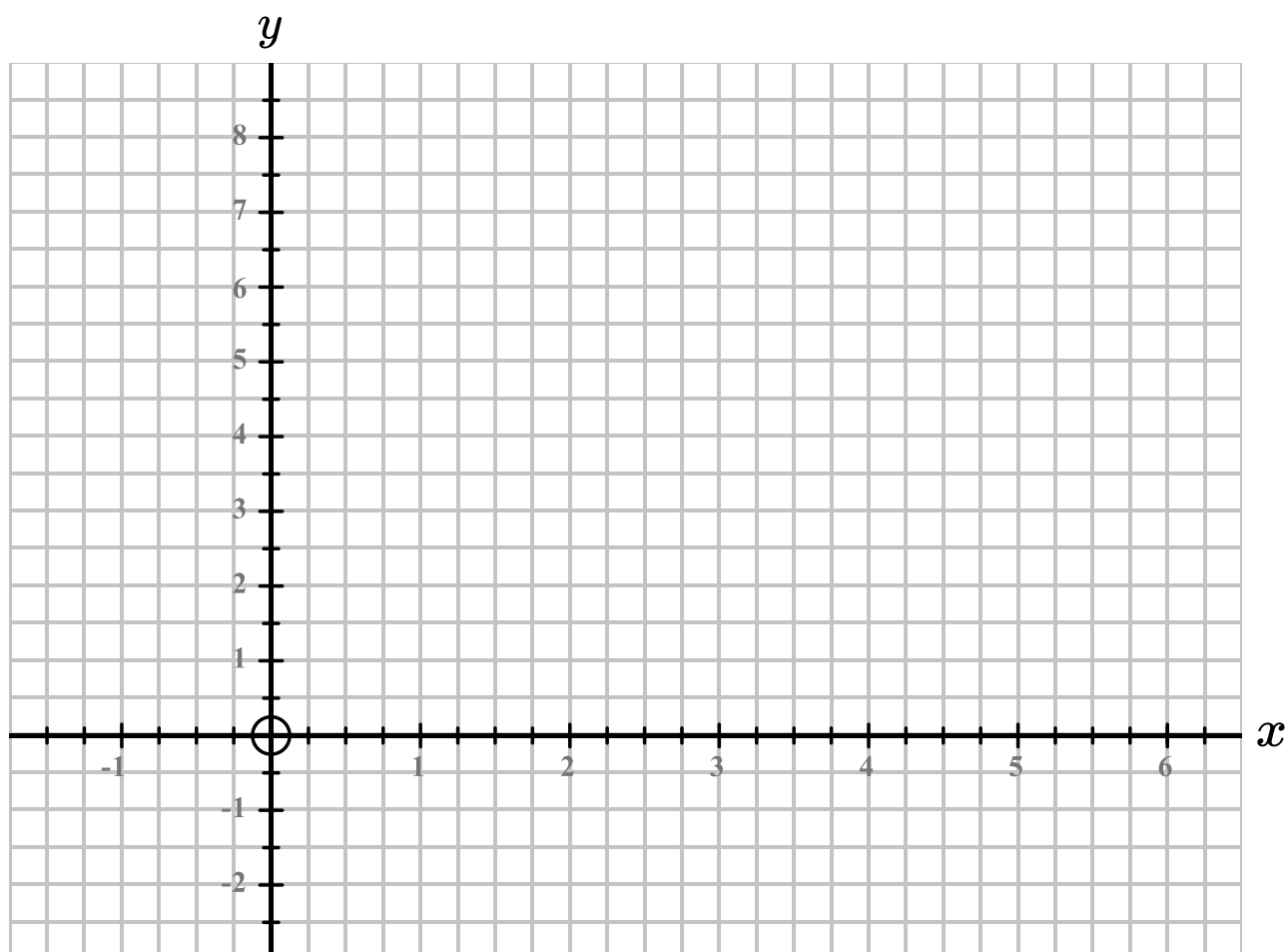
Answer \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_

15 On the grid show, by shading, the region that satisfies all of these inequalities.

$$y > 1 \qquad 2x + y \leq 6 \qquad y < 2x + 3$$

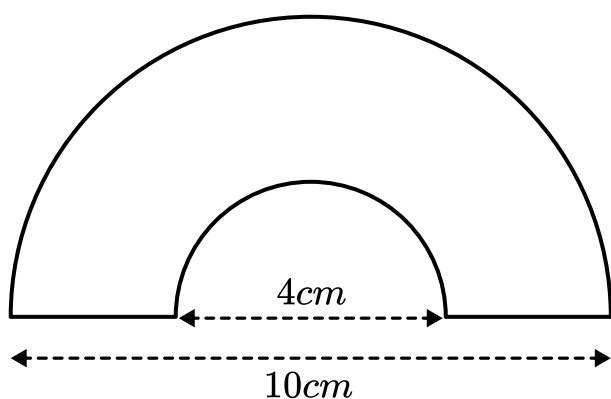
Label the region **R**.

[3 marks]



**Turn over for the next question**

- 16 This shape has been made by removing a small semi-circular area from a larger semi-circle.



Work out the perimeter of the shape. Give your answer in terms of  $\pi$ .

**[4 marks]**

---

---

---

---

---

Answer \_\_\_\_\_ *cm*

- 17  $a$  is inversely proportional to the square of  $b$ .

$$b = 6 \text{ when } a = 2$$

Work out an equation connecting  $a$  and  $b$ .

**[2 marks]**

---

---

---

Answer \_\_\_\_\_

**18(a)** Write  $\frac{6}{x+2} + \frac{5}{x-1}$  as a single fraction in its simplest form.

**[3 marks]**

---

---

---

---

---

Answer \_\_\_\_\_

**18(b)** Simplify fully  $\frac{x^2 - 16}{x^2 - 3x - 28}$

**[3 marks]**

---

---

---

---

---

---

---

Answer \_\_\_\_\_

- 19** Dave wants to find an estimate for the number of fish in a lake.

On Monday he catches 80 fish.

He puts a mark on each fish and returns it to the lake.

On Tuesday he catches 120 fish.

He finds that 6 of these fish have been marked.

Work out an estimate for the number of fish in the lake.

**[3 marks]**

---

---

---

---

Answer \_\_\_\_\_

- 20** Show that  $\frac{2\sqrt{60} - \sqrt{15}}{\sqrt{5}}$  can be written in the form  $a\sqrt{3}$  where  $a$  is an integer.

**[4 marks]**

---

---

---

---

---

---

---

---

A circle with points  $A, B, C,$  and  $D$  on its circumference. Chords  $AC$  and  $BD$  are drawn, intersecting inside the circle. Angle  $ABC$  is labeled as  $23^\circ$  and angle  $BDC$  is labeled as  $67^\circ$ .

**[3 marks]**

[illegible]

© Third Space Learning 2023. You may photocopy this page.



**22** Given that  $x^2 - 6x + 15 = (x - a)^2 + b$  for all values of  $x$ ,

**22(a)** Find the value of  $a$  and the value of  $b$ .

**[2 marks]**

---

---

---

$a =$  \_\_\_\_\_

$b =$  \_\_\_\_\_

**22(b) (i)** Hence write down the coordinates of the turning point on the graph  $y = x^2 - 6x + 15$

**[1 mark]**

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

**22(b) (ii)** Explain how this shows that there are no solutions to the equation  $x^2 - 6x + 15 = 0$

**[1 mark]**

---

---

---

**23** The functions  $f$  and  $g$  are such that,

$$f(x) = 3x + 2 \text{ and } g(x) = x^2 + x$$

**23(a)** Work out  $f^{-1}(44)$

**[3 marks]**

---

---

---

---

---

Answer \_\_\_\_\_

**23(b)** Solve  $gf(x) = 0$

**[4 marks]**

---

---

---

---

---

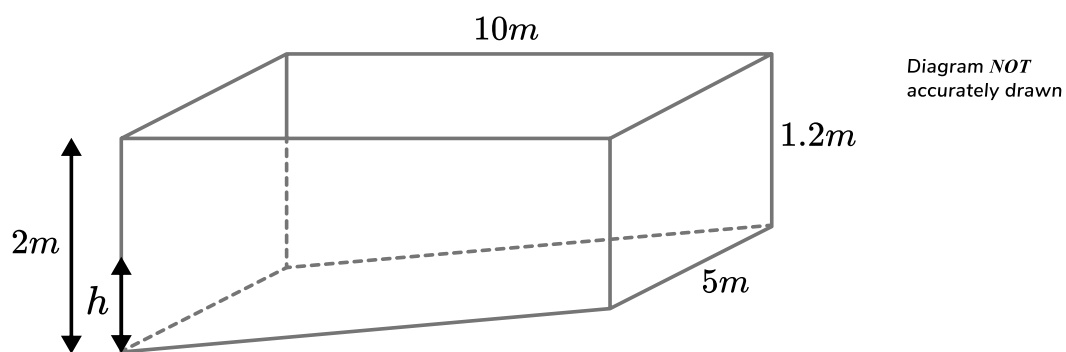
---

---

---

Answer \_\_\_\_\_

**24** Here is a cross section of a swimming pool.



# 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