



THIRD SPACE  
LEARNING

# Mathematics

## Paper 1

### (Non-Calculator)

## Higher Tier

Edexcel GCSE

SET 2

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

## 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.

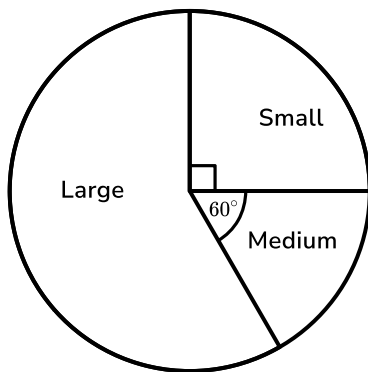
**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

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 Find the highest common factor of 64 and 80.

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

- 2 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.

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(Total for Question 2 is 4 marks)

- 3 (a) Write  $3.8 \times 10^{-5}$  as an ordinary number.

-----  
(1)

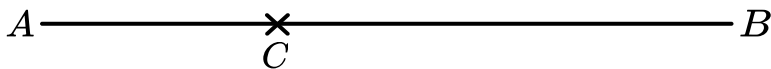
- (b) Work out  $2 \times 10^2 \times 4.1 \times 10^5$

Give your answer in standard form.

-----  
(2)

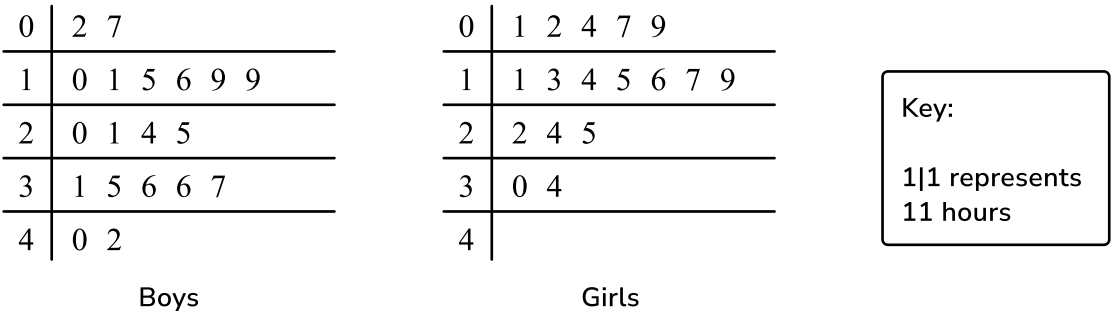
(Total for Question 3 is 3 marks)

- 
- 4 C is a point on the straight line AB.  
Construct the perpendicular to the line AB at the point C.  
You must show all construction lines.



(Total for Question 4 is 3 marks)

5 These stem and leaf diagrams show some information about the number of hours the children from a class spent revising for their maths GCSE.



Compare the amount of time spent revising by the boys to the amount of time spent revising by the girls.

(Total for Question 5 is 2 marks)

6 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.

(a) Find the probability that Olivia wins.

(2)

Oscar will charge 50p to play the game.

The prize for winning is £1.

200 people play the game.

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

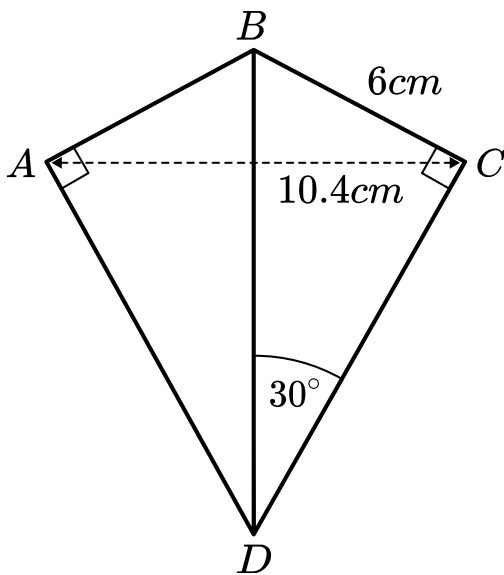
(3)

(Total for Question 6 is 5 marks)

7 (a) Write down the exact value of  $\sin 30^\circ$

(1)

(b) ABCD is a kite.



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

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

Work out the area of ABCD

$\text{cm}^2$

(4)

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

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

-----  
(1)

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

-----  
(2)

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

-----  
(1)

**(Total for Question 8 is 4 marks)**

9 Sheila is baking cupcakes. Her recipe makes 12 cupcakes.

The recipe ingredients are shown in the table below.

Butter	120g
Sugar	150g
Eggs	2
Flour	140g

Sheila has plenty of sugar and flour. She has 300g of butter and 6 eggs.

What is the maximum number of cupcakes Sheila can make?

-----  
**(Total for Question 9 is 2 marks)**

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

-----  
(Total for Question 10 is 2 marks)

- 11 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

- (a) Complete the cumulative frequency table.

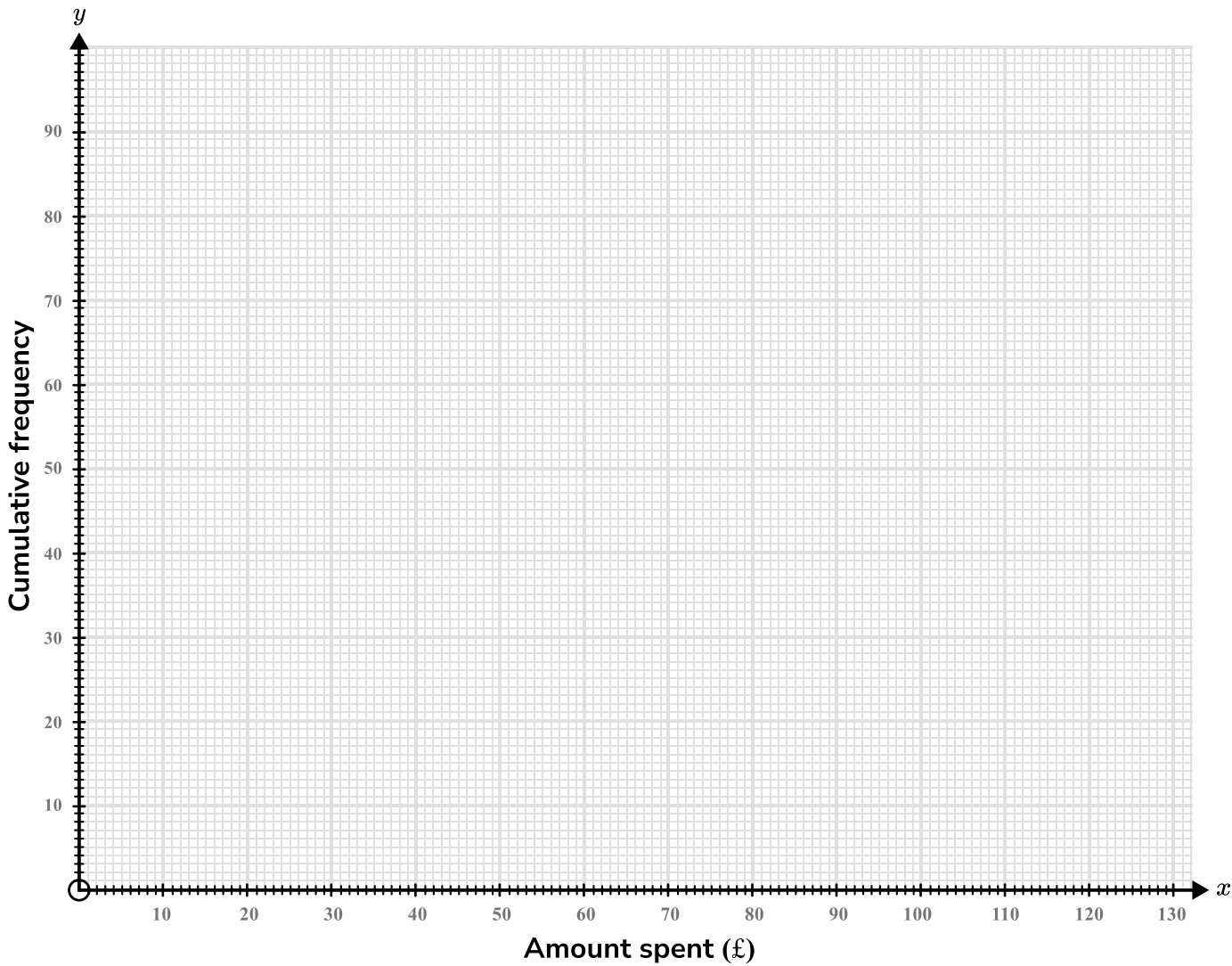
Amount spent (£s)	Cumulative frequency
$0 \leq s < 20$	
$20 \leq s < 40$	
$40 \leq s < 60$	
$60 \leq s < 80$	
$80 \leq s < 100$	
$100 \leq s < 120$	

(1)



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

(2)

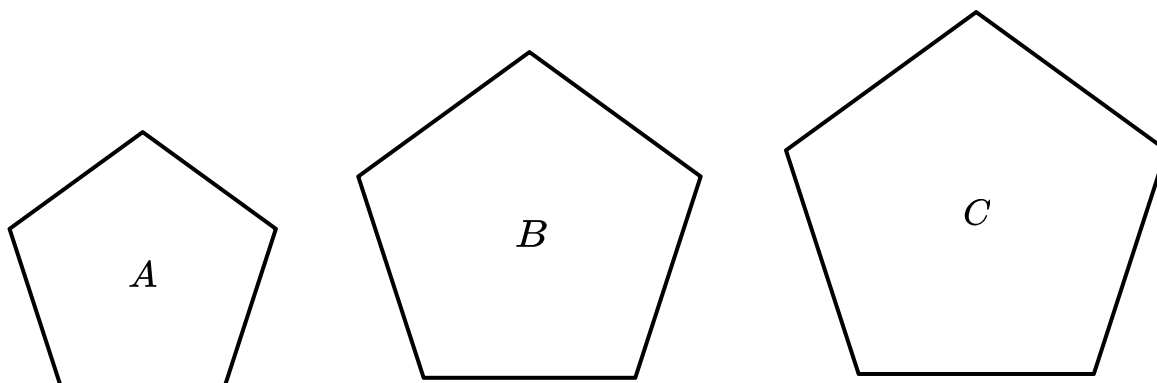


(c) On Sunday, the median spend of the first 80 customers was £25. Compare this to the median spend of the first 80 customers on Saturday.

(2)

(Total for Question 11 is 5 marks)

**12** 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.

----- : ----- : -----

**(Total for Question 12 is 4 marks)**

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

-----  
(3)

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

-----  
(3)

**(Total for Question 13 is 6 marks)**

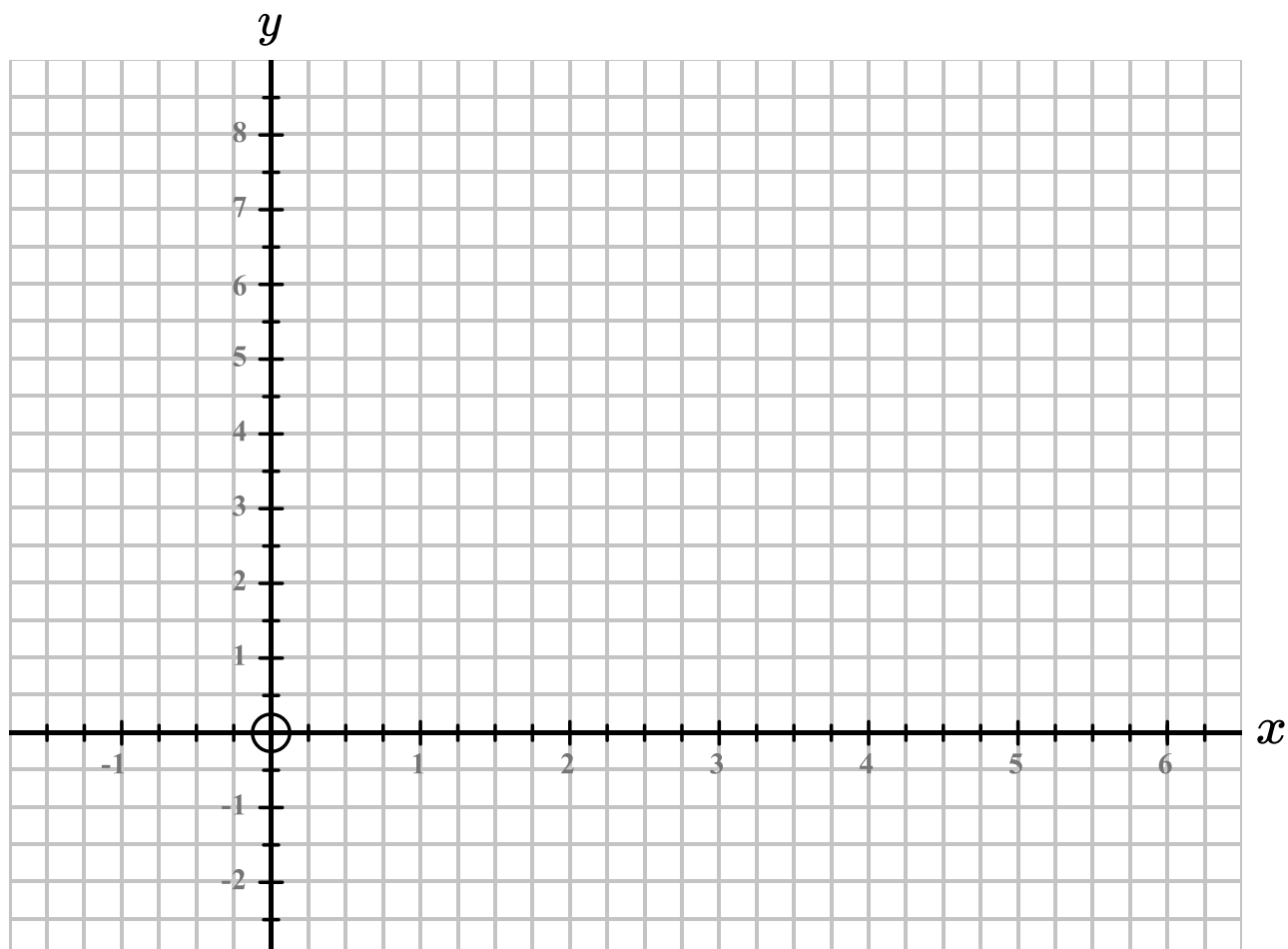
14 On the grid show, by shading, the region that satisfies all of these inequalities.

$$y > 1$$

$$2x + y \leq 6$$

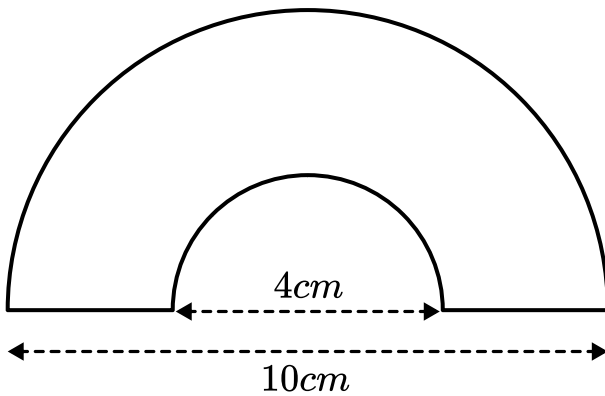
$$y < 2x + 3$$

Label the region **R**.



(Total for Question 14 is 3 marks)

- 15 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  $\pi$ .

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

- 16 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.

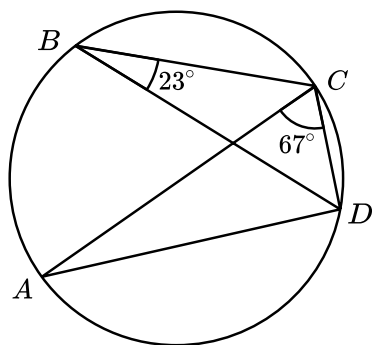
On Tuesday he catches 120 fish.

He finds that 6 of these fish have been marked.

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

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

**17** Here is a circle.



Use circle theorems to show that AC is a diameter of the circle.

**(Total for Question 17 is 3 marks)**

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

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

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

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

-----  
(2)

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

(                      ,                      )  
-----  
(1)

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

-----  
-----  
(1)

**(Total for Question 19 is 4 marks)**

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

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

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

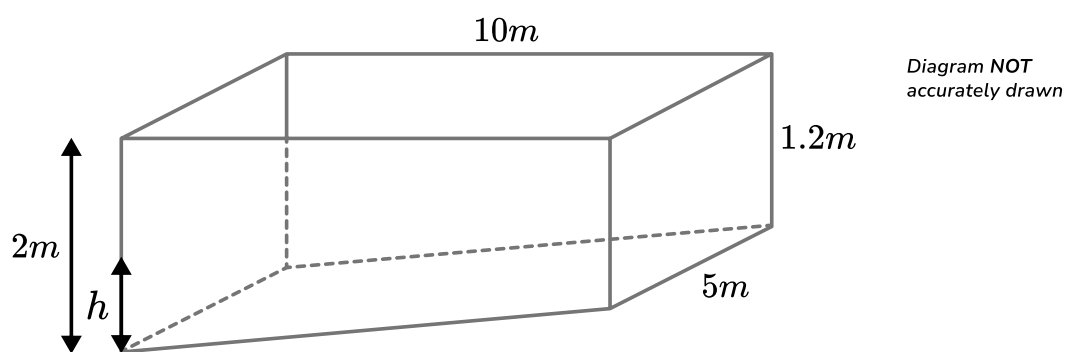
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(3)

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

-----  
(4)

**(Total for Question 20 is 7 marks)**

21 Here is a cross section of a swimming pool.



The top of the pool is horizontal.

To begin with, the pool is empty.

Water flows into the pool at a rate of 20 litres per minute.

Water flows into the pool for 20 hours.

$$1\text{m}^3 = 1000\text{l}.$$

Find the depth of the water,  $h$ , measured at the deepest point of the pool, after 20 hours.

$m$

(Total for Question 21 is 5 marks)

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