



THIRD SPACE  
LEARNING

# Mathematics

## Paper 1

### (Non-Calculator)

## Higher Tier

Edexcel GCSE

SET 1A

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

## GCSE SET 1A

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.

This practice paper is based on the topics from the **advanced information for the Summer 2022 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 Solve the inequality  $3(y-4) < 6$ .

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

---

- 2 Write 420 as a product of its prime factors. Give your answer in index form.

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

---

- 3 (a) Write the number 4 720 000 in standard form.

-----  
(1)

- (b) Write  $7.1 \times 10^3$  as an ordinary number.

-----  
(1)

- (c) Calculate  $(4.6 \times 10^4) + (5.12 \times 10^5)$

Give your answer in standard form.

-----  
(2)  
(Total for Question 3 is 4 marks)

---

- 4 Farm A has 120 sheep.  $\frac{4}{5}$  of the sheep have lambs. Some of the sheep have 1 lamb and some of the sheep have 2 lambs. The ratio of the sheep who have 1 lamb to the sheep who have 2 lambs is 3:5.

(a) What fraction of the sheep who have lambs on farm A have 2 lambs?

-----  
(1)

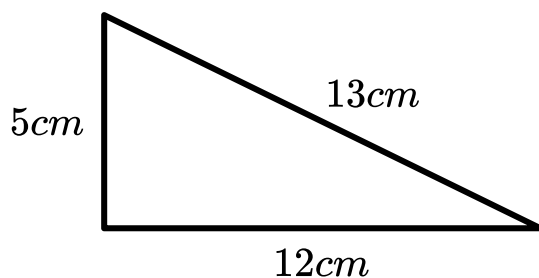
Farm B has 200 sheep. 60% of the sheep have lambs. 25% of those sheep have 2 lambs and 1 sheep has 3 lambs. The rest have 1 lamb.

(b) Which farm has the greatest number of lambs? Show how you decide.

-----  
(3)

(Total for Question 4 is 4 marks)

- 5 Here is a triangle.



Is this triangle a right angled triangle? Explain how you decide.

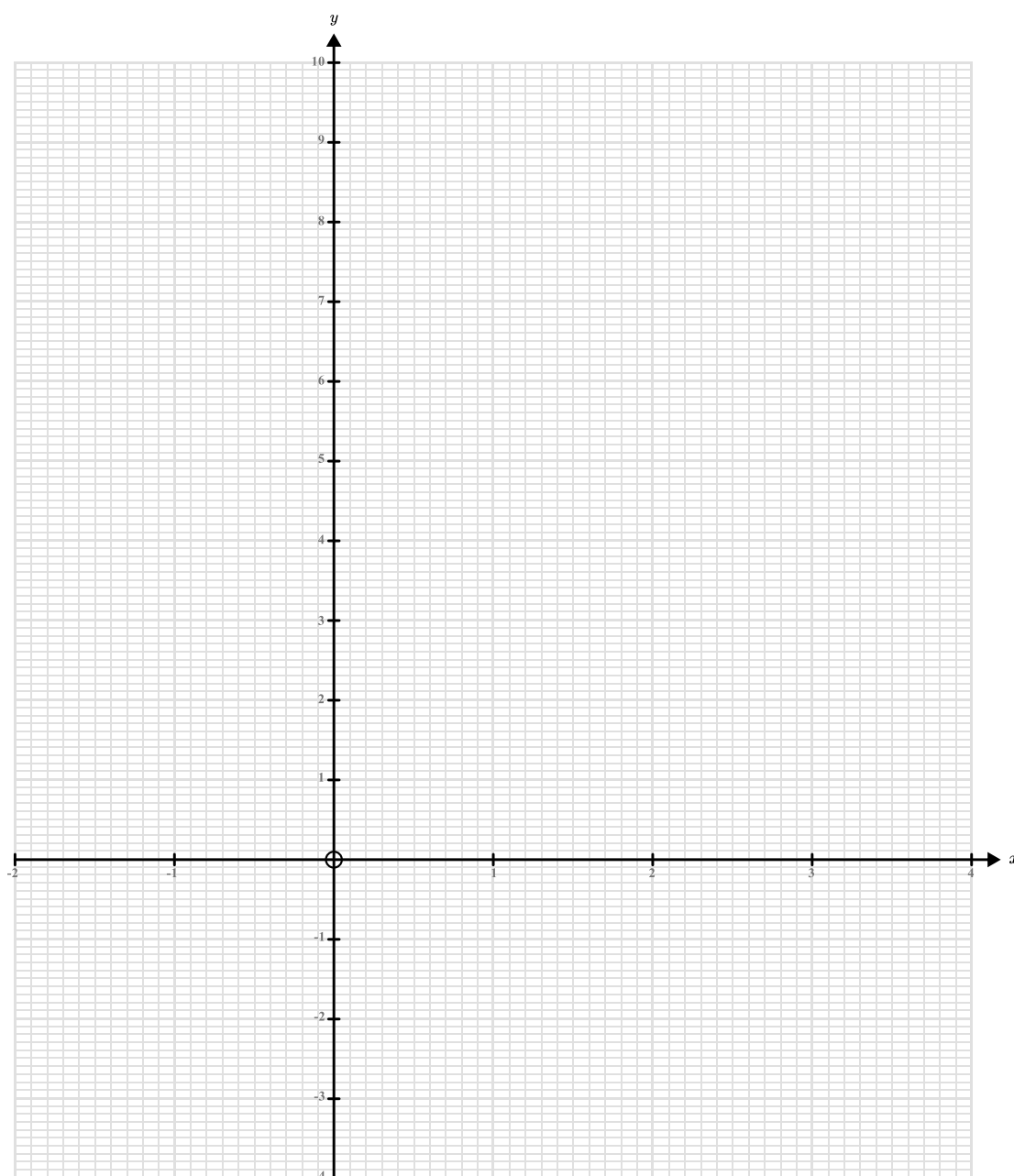
-----  
(Total for Question 5 is 2 marks)

- 6 (a) Complete the table of values for  $y = x^2 - 2x$

$x$	-2	-1	0	1	2	3	4
$y$	8		0			3	8

(2)

- (b) On the grid below, draw the graph of  $y = x^2 - 2x$

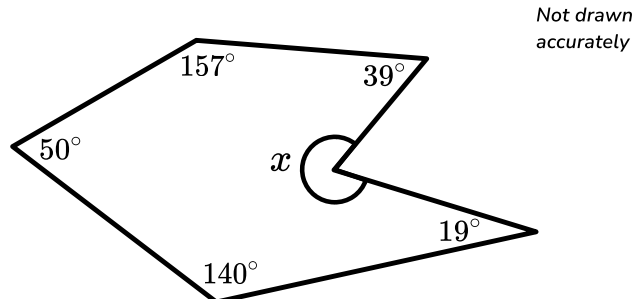


- (c) Write down the solutions of the equation  $x^2 - 2x = 0$ .

(1)

(Total for Question 6 is 5 marks)

- 7 This is a hexagon. Work out the size of angle  $x$ .



-----  
(Total for Question 7 is 3 marks)

- 8 Here are 4 equations describing different proportional relationships between  $y$  and  $x$ .

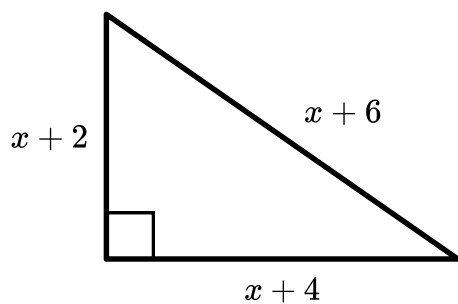
A.  $y = \frac{1}{2x}$       B.  $y = 2x^2$       C.  $y = \frac{1}{2}x$       D.  $y = \frac{2}{x^2}$

Write the letter of the corresponding equation for each of the following relationships:

	Letter of equation
$y$ is directly proportional to $x$	
$y$ is inversely proportional to $x$	
$y$ is inversely proportional to $x^2$	

(Total for Question 8 is 3 marks)

- 9 The area of this triangle is  $24\text{cm}^2$ .



- (a) Show that  $x^2 + 6x - 40 = 0$

(2)

- (b) Solve the equation  $x^2 + 6x - 40 = 0$  and hence find the perimeter of the triangle.

cm

(2)

(Total for Question 9 is 4 marks)

- 10 Work out the value of  $\sin(30) + \tan(45)$

2

(Total for Question 10 is 2 marks)

**11** 7 friends all take the same test. Here are 6 of their marks:

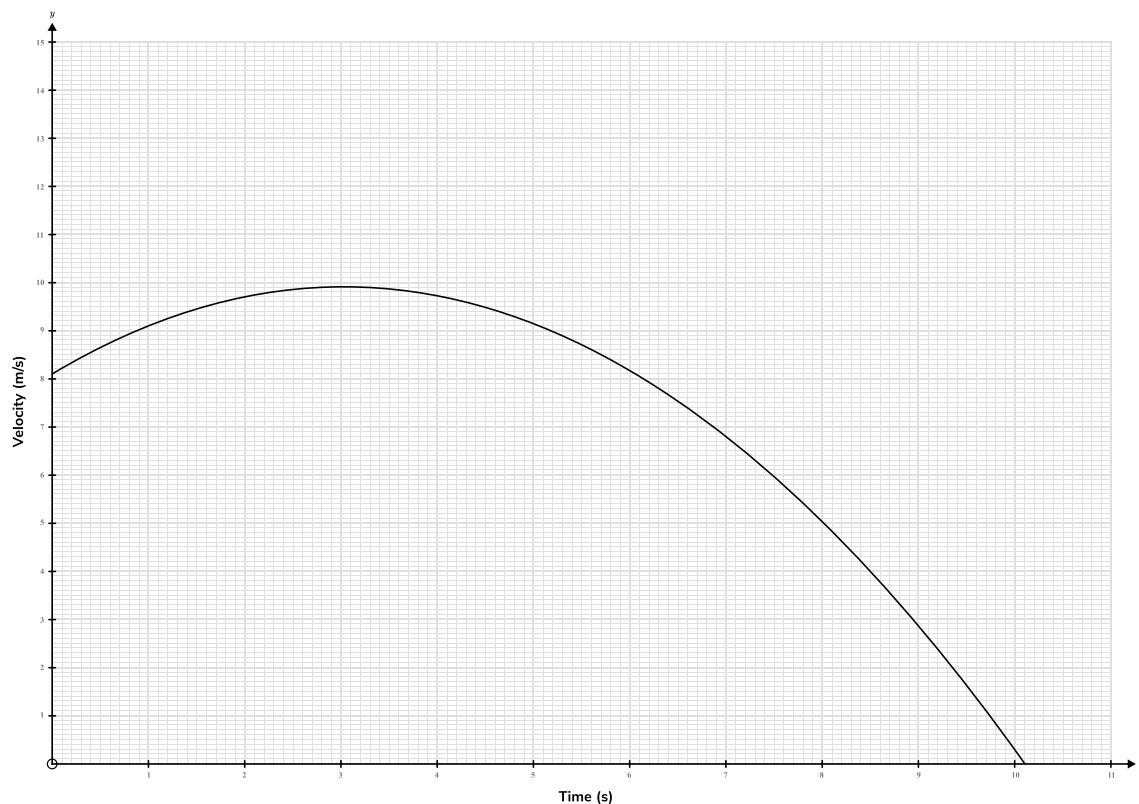
12 14 17 11 15 10

Katie's mark has been missed from the list. The mean mark including Katie's mark is 13.

Work out Katie's mark.

-----  
(Total for Question 11 is 3 marks)

**12** This velocity time graph shows the velocity of a car over 10 seconds.



(a) At what time is the acceleration of the car  $0 \text{ m/s}^2$ ?

-----  
(1)

(b) Calculate an estimate for the acceleration of the graph when  $t=8$ .

-----  $\text{m/s}^2$   
(2)

(Total for Question 12 is 3 marks)

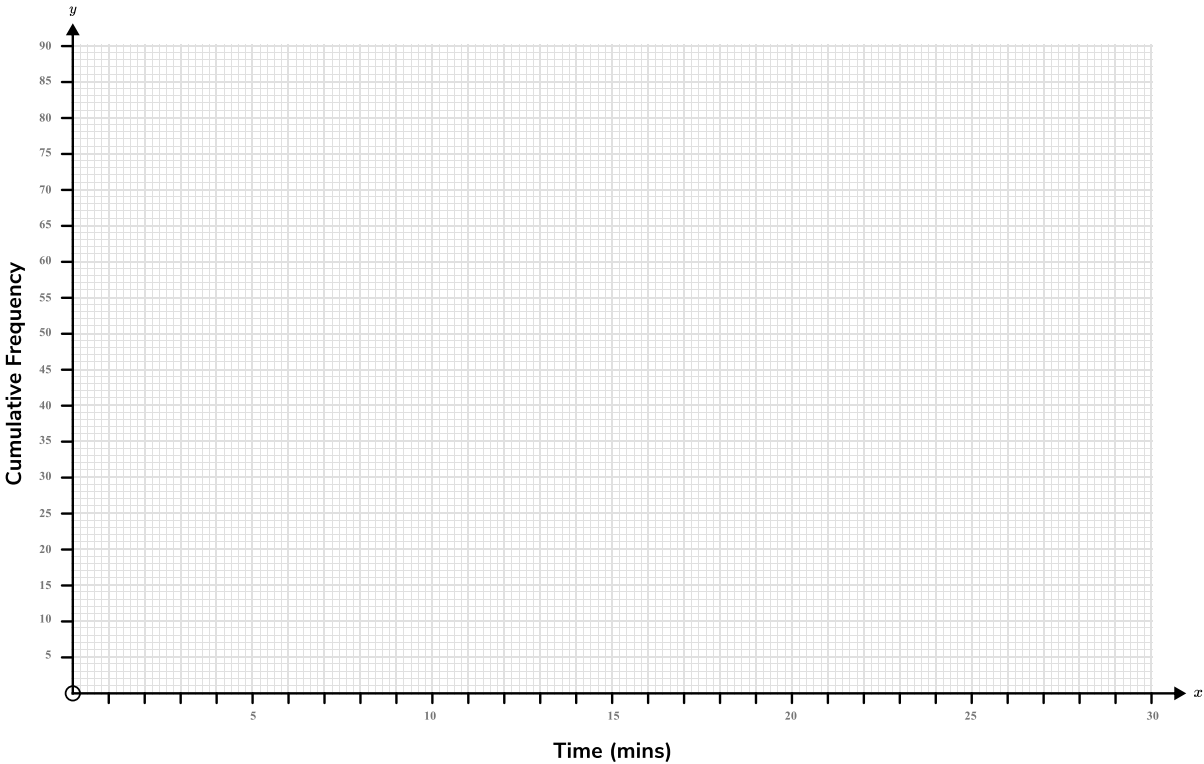


13 This table shows the amount of time it takes 80 students to travel to school:

Time, $t$ (mins)	Frequency	Cumulative Frequency
$0 \leq t < 5$	8	
$5 \leq t < 10$	14	
$10 \leq t < 15$	21	
$15 \leq t < 20$	17	
$20 \leq t < 25$	11	
$25 \leq t < 30$	9	

(a) Complete the cumulative frequency column. (1)

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



(c) Use your cumulative frequency graph to estimate the interquartile range of the times taken for students to travel to school. (2)

(d) Miss Jones says that less than 10% of students travel for more than 22 minutes. Use your cumulative frequency graph to estimate the number of students who travel for more than 22 minutes and decide if Miss Jones is correct or not. (3)

(Total for Question 13 is 8 marks)

14 (a) Calculate  $1\frac{3}{4} \times 2\frac{1}{5}$

-----  
(2)

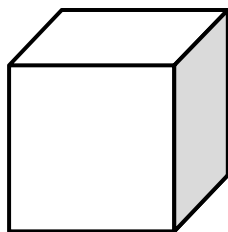
(b) Write  $\frac{4x+1}{2} + \frac{3x-1}{5}$  as a single fraction in its simplest form.

-----  
(2)

(Total for Question 14 is 4 marks)

- 15 Here is a cube. The surface area of the cube is  $150\text{cm}^2$ . The cube is made from a material with a density of  $0.8\text{g/cm}^3$ . Work out the mass of the cube.

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$



..

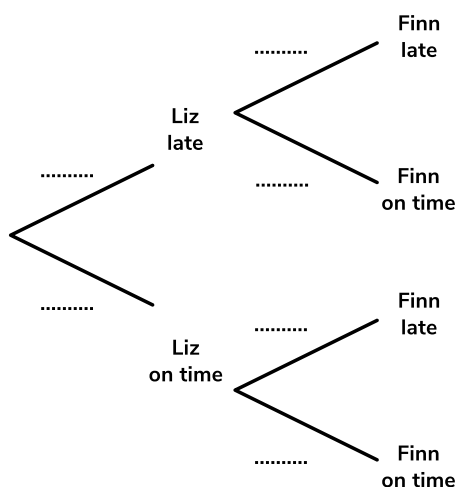
-----g  
(Total for Question 15 is 4 marks)

16 Prove that 0.45 can be written as  $\frac{5}{11}$ .

(Total for Question 16 is 2 marks)

- 17 The probability that Liz is late for school is  $\frac{1}{10}$ . The probability that Finn is late for school is  $\frac{3}{20}$ .

Complete the probability following tree diagram:



(2)

Calculate the probability that on a given day at least one of them is late.

(2)

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

- 18 (a) Evaluate  $16^{\frac{3}{2}}$

(2)

- (b) Evaluate  $\frac{2^3 \times 2^{-1}}{2^4}$

(2)

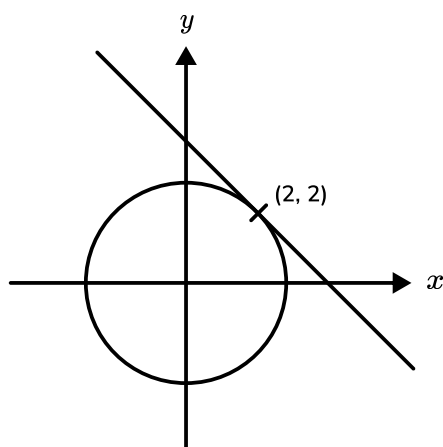
**(Total for Question 18 is 4 marks)**

19 Write  $(3 + \sqrt{2})(4 + \sqrt{8})$  in the form  $a + b\sqrt{2}$

-----  
(Total for Question 19 is 3 marks)

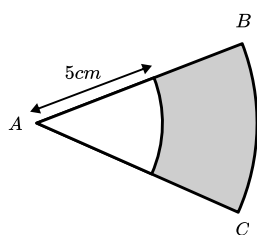
20 Here is the circle  $x^2 + y^2 = 8$

Find the equation of the tangent to the circle at the point  $(2, 2)$ .



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

**21** ABC is a sector with radius 10cm and area  $20\text{cm}^2$ .



(a) Work out the size of angle BAC. Leave your answer in terms of  $\pi$ .

-----  
(2)

(b) Calculate the size of the shaded area.

-----  $\text{cm}^2$   
(3)

(c) Write the ratio of the shaded area to the non-shaded area. Give your answer in its simplest form.

-----  
(1)

**(Total for Question 21 is 6 marks)**

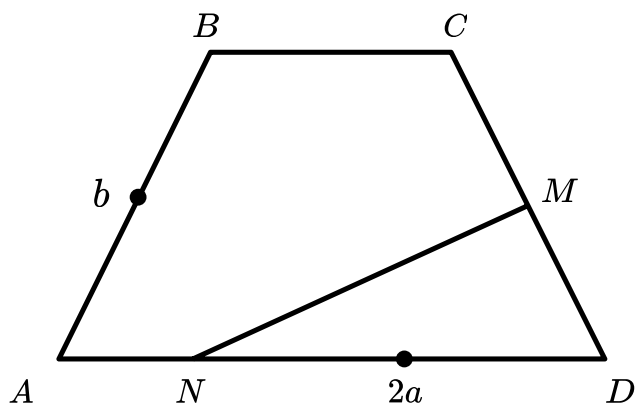
**22** ABCD is a trapezium.

$$\overrightarrow{AB} = b$$

$$\overrightarrow{AD} = 2a$$

$$\overrightarrow{BC} = \frac{1}{2} \overrightarrow{AD}$$

M is the midpoint of CD and N is the point such that AN:ND=1:3.



Find the vector  $\overrightarrow{NM}$ .

(Total for Question 22 is 4 marks)

# 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