



THIRD SPACE  
LEARNING

# Mathematics

## Paper 5

### (Non-Calculator)

### Higher Tier

OCR GCSE

SET 4

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

## GCSE SET 4

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 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.

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

### 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 2025 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 132 as a product of its prime factors.

----- [2]

- 2 Astrid's house is  $2\frac{1}{2}$  miles west of Felix's house. Hannah's house is  $5\frac{1}{3}$  miles east of Astrid's house.  
How far is it from Felix's house to Hannah's house?

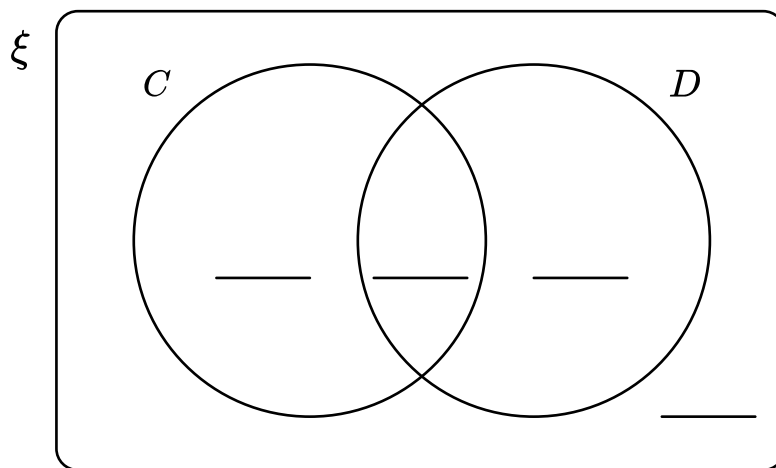
Give your answer as a mixed number.

----- [4]

**3** Here is some information about a group of 60 students.

- $\frac{1}{3}$  of the students own neither a cat nor a dog.
- 27 students own a dog (  $D$  )
- 24 students own a cat (  $C$  )

**(a)** Complete this Venn diagram to represent this information.



**[3]**

**(b)** One of the students is chosen at random.

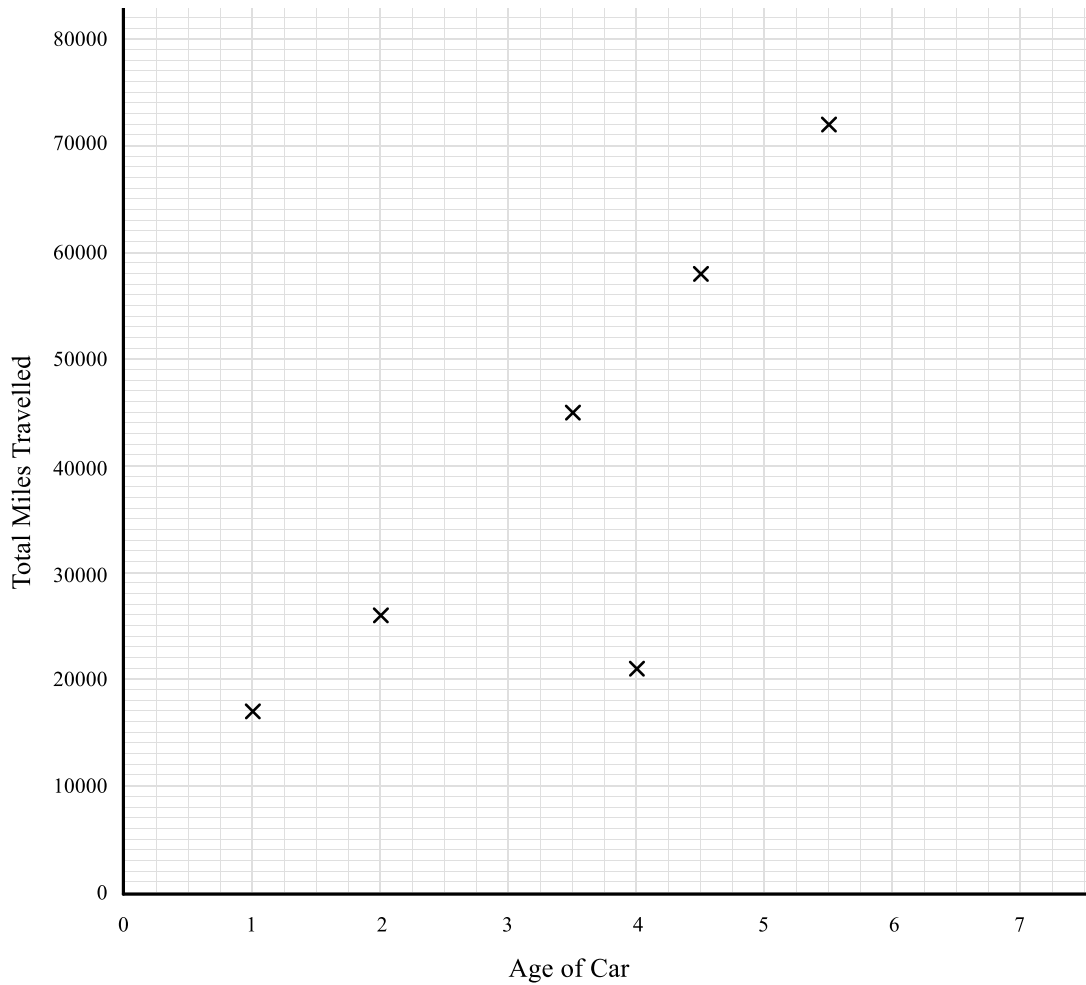
Find the probability that this student owns a cat and a dog.

**[2]**

- 4 The table shows information about the age and total miles covered by some cars belonging to a certain company.

Age (years)	1	3.5	4.5	2	4	5.5	7	3	5	1.5
Miles	17000	45000	58000	26000	21000	72000	77000	32000	67000	17000

The points for the first six cars are plotted on the scatter diagram.



- (a) Plot the points for the remaining four cars.

[2]

- (b) Describe the type of correlation shown in the scatter diagram.

[1]

Question continued on the next page

**(c) (i)** On the scatter diagram, circle the car that has the lowest average miles travelled per year.

**(ii)** Calculate the average number of miles travelled per year for this car.

**(c)(ii)** ..... **[2]**

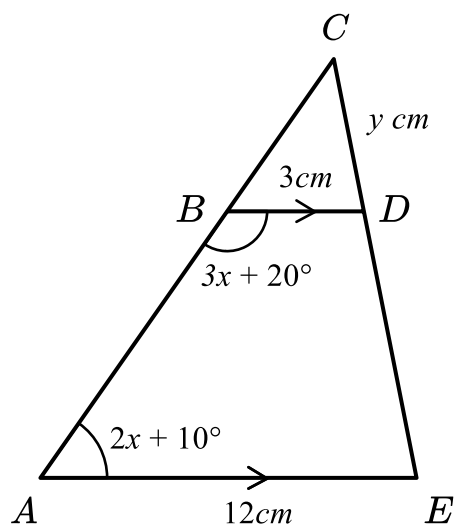
**(d)** Explain the limitations of using the equation of the line of best fit to estimate the number of miles travelled by a car that is 12 years old.

.....

.....

**[1]**

5  $ACE$  is a triangle.



$ABC$  and  $CDE$  are straight lines.

$AE$  is parallel to  $BD$ .

Angle  $BAE = 2x + 10^\circ$

Angle  $ABD = 3x + 20^\circ$

$BD = 3 \text{ cm}$

$CD = y \text{ cm}$

$AE = 12 \text{ cm}$

(a) Work out the value of  $x$ .

(a)  $x =$  ..... [3]

(b) Find an expression, in terms of  $y$ , for the length of  $CE$ .

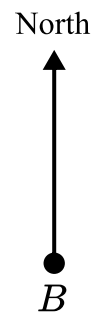
(b) ..... [2]

- 6 The scale drawing shows town  $A$  and town  $B$ .

The scale is  $1\text{cm}$  represents  $8\text{km}$ .

Livvy needs to get to a location that is on a bearing of  $75^\circ$  from town  $A$  and is  $28\text{km}$  from town  $B$ .

Mark the location on the map and label it  $C$ .

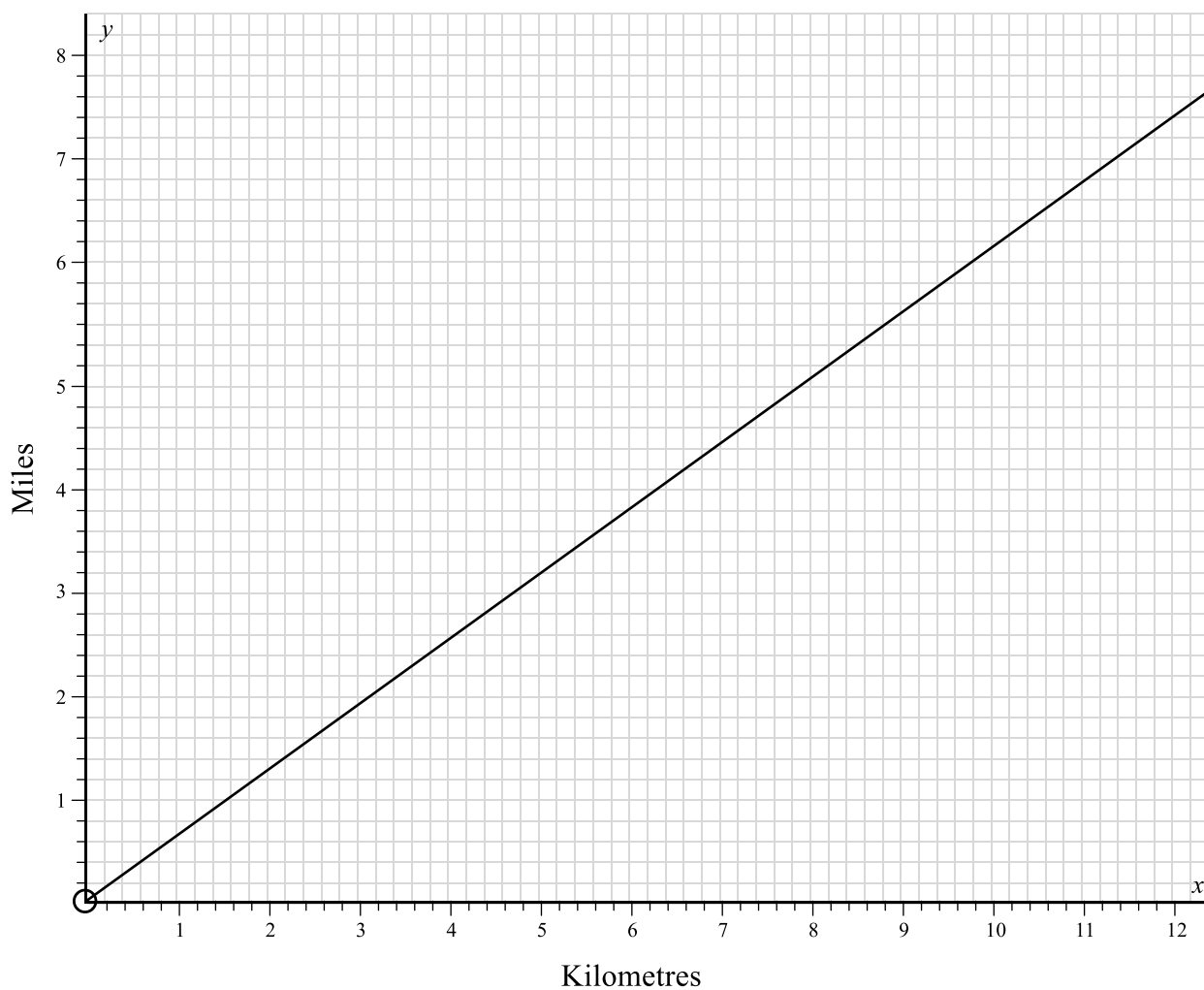


**Scale:**  $1\text{cm}$  represents  $8\text{km}$

[3]



7 Here is a conversion graph for *kilometres* and *miles*.



Yussef is travelling along a road with a speed limit of 50 *miles per hour*.

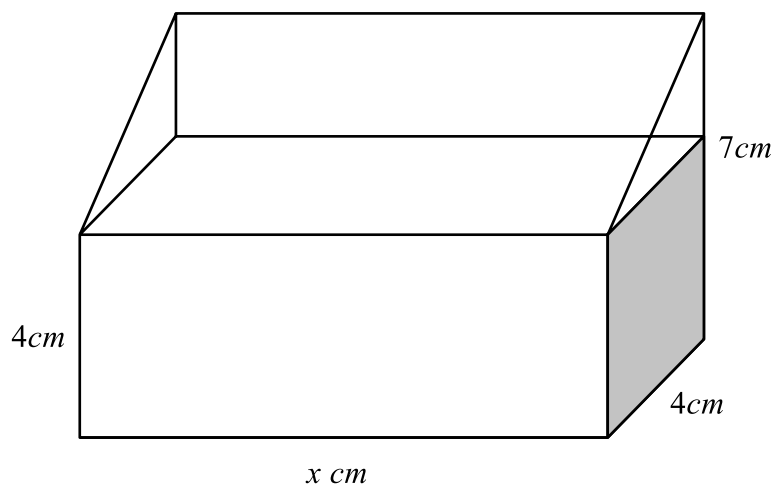
Yussef is travelling at 25 *metres per second*.

Is Yussef breaking the speed limit?

Show how you decide.

[3]

- 8 Here is a 3D shape made from a cuboid and a triangular prism.



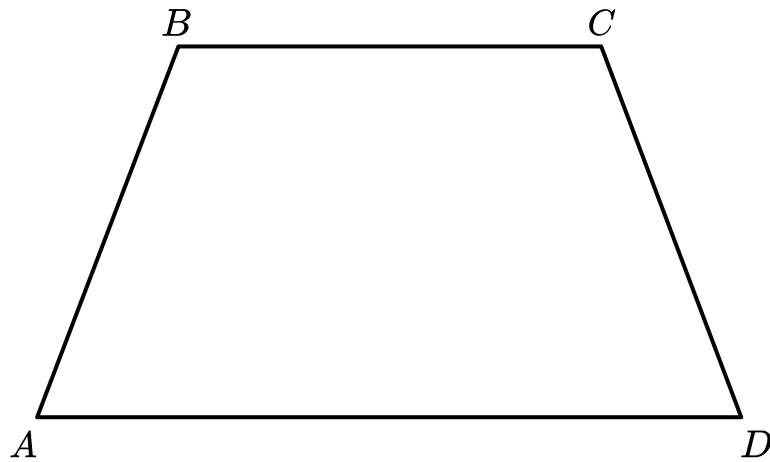
The volume of the shape is  $198\text{cm}^3$ .

Work out the length,  $x$ , of the shape.

.....  $\text{cm}^2$  [4]

- 9 The diagram shows an office.

Scale: 1 cm represents 5 m



A security camera at point  $A$  can see everything that is closer to  $AB$  than to  $AD$ .

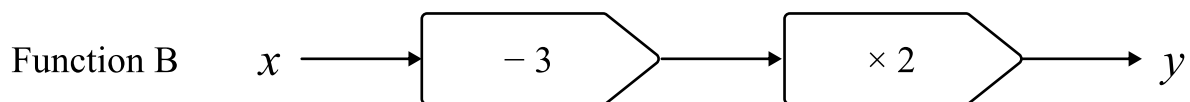
A security guard can see everything within 15 m of the wall  $AD$ .

A security camera at  $C$  can see everything within 20 m of point  $C$ .

Using a ruler and compasses only, construct and shade the region which can be seen by the security measures.

[6]

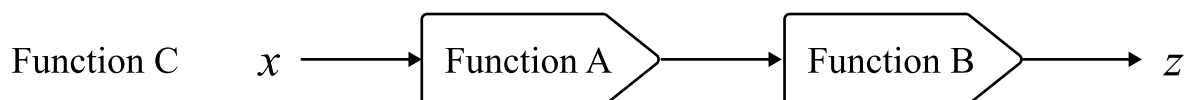
10 Here are two functions.



(a) Find an algebraic expression for the output of the **inverse** of function A when the input is  $x$ .

(a) ..... [2]

(b) Here is a composite function C.



Find the value of  $x$  when  $z = 6x$ .

(b)  $x =$  ..... [5]

11 (a) Find the value of  $25^{-\frac{1}{2}}$ .

(a) ..... [2]

(b) Work out  $16^{\frac{3}{2}} + 27^{\frac{5}{3}}$ .

(b) ..... [3]

(c) Write  $5^n \times 25^{n+2}$  as a power of 5.

(c) ..... [2]

---

12 Solve  $p < \frac{p+6}{3} + 3$ .

..... [3]

**13** This table gives information about the number of hours worked in a week by 80 teachers.

Number of hours ( $h$ )	Frequency
$30 < h \leq 35$	6
$35 < h \leq 40$	12
$40 < h \leq 45$	18
$45 < h \leq 50$	21
$50 < h \leq 55$	15
$55 < h \leq 60$	8

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

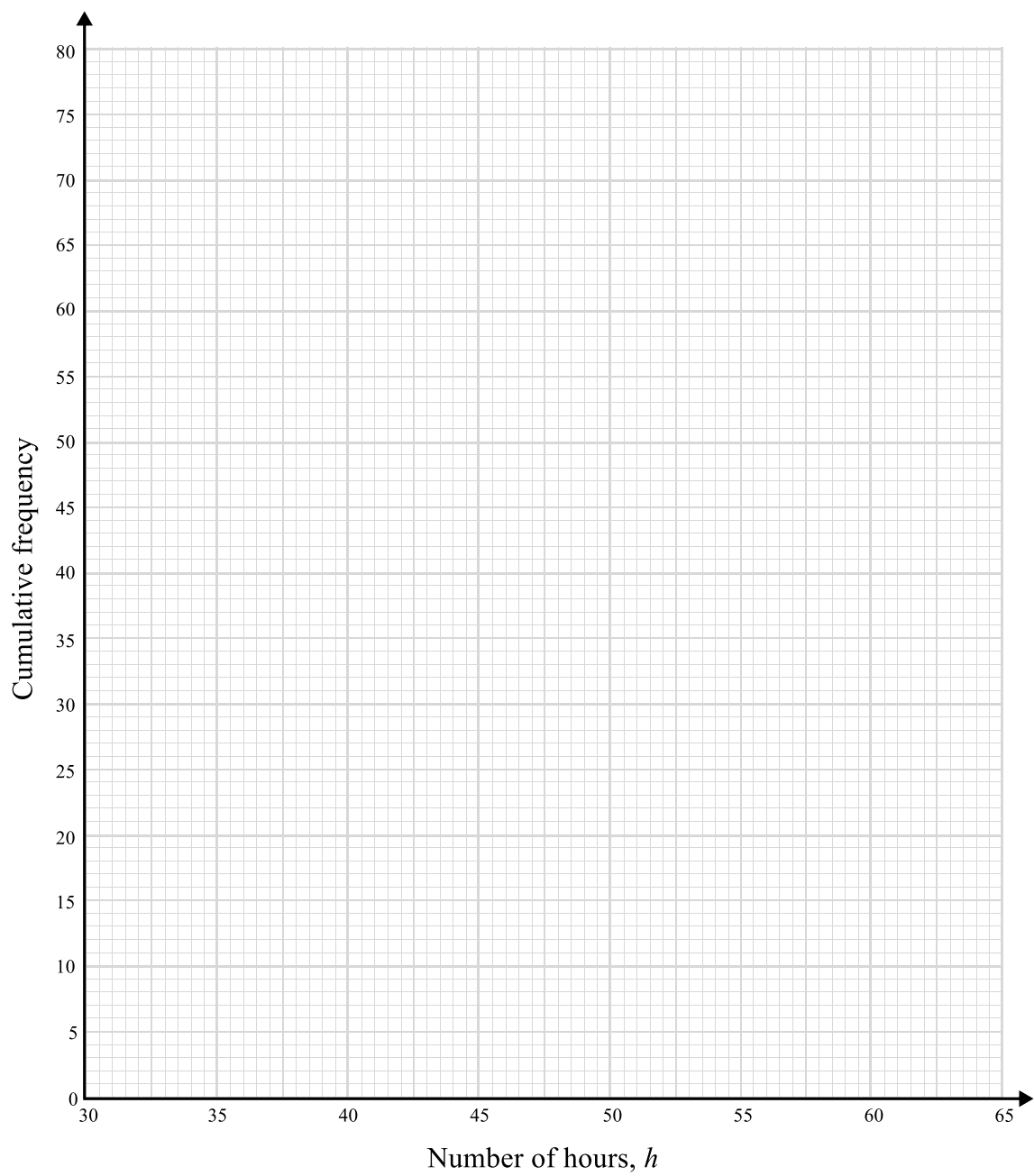
Number of hours ( $h$ )	Cumulative frequency
$h \leq 35$	
$h \leq 40$	
$h \leq 45$	
$h \leq 50$	
$h \leq 55$	
$h \leq 60$	

**[2]**

**Question continued on the next page**

**(b)** Draw a cumulative frequency graph to represent the data.

**[3]**



**(c)** Jana says ‘approximately 75% of teachers worked less than 51 hours’.

Jana is \_\_\_\_\_ because \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**[2]**

**14**  $y$  is inversely proportional to  $x^3$ .

When  $x$  is 4,  $y$  is 10.

Find the value of  $y$  when  $x$  is 10.

$y =$  ..... [3]

---

**15** Simplify  $\frac{x+5}{4} - \frac{x-3}{3}$ .

..... [3]

---



**16 (a)** Write  $\frac{5}{11}$  as a recurring decimal.

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

**(b)** Using algebra, prove that  $0.08\dot{3} \times 0.4$  is equivalent to  $\frac{1}{27}$ .

**[5]**

**17**  $A$ ,  $B$  and  $C$  are three points on a straight line, in that order, such that

$$\text{length of } AB : \text{length of } BC = 3:5$$

$$\overrightarrow{AB} = 9\mathbf{a} - 6\mathbf{b}$$

Find the vector  $\overrightarrow{AC}$ .

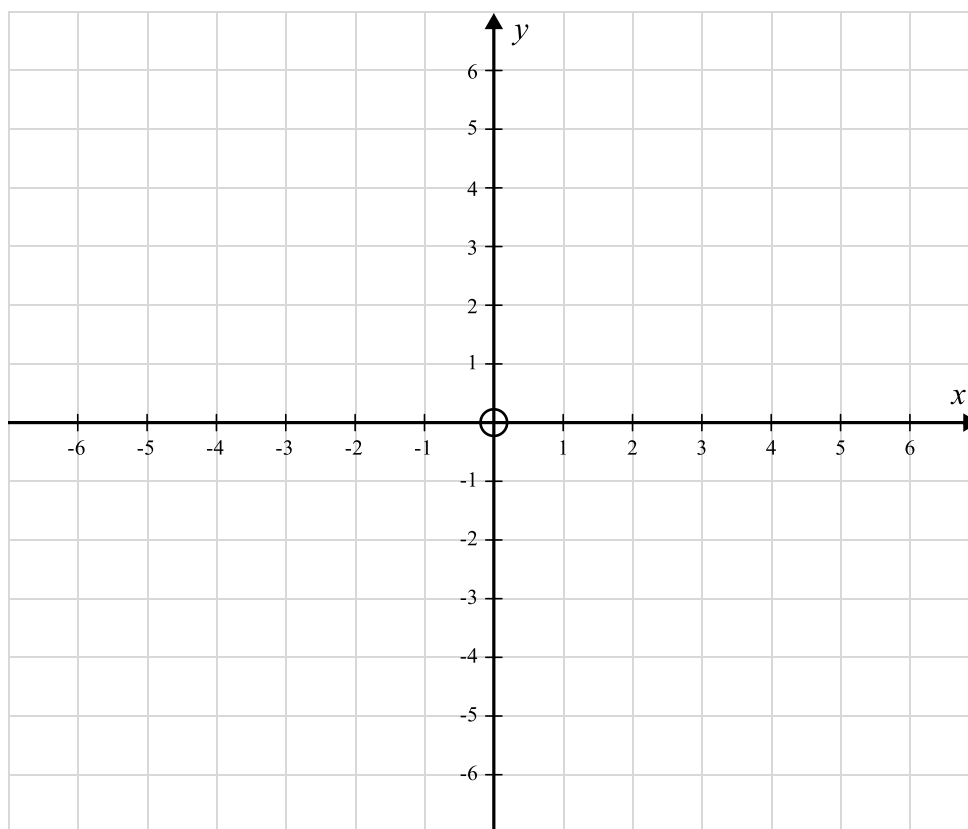
----- **[3]**

- 18** On the grid show, by shading, the region that satisfies all of these inequalities.  
Label the region  $R$ .

$$y < 2x$$

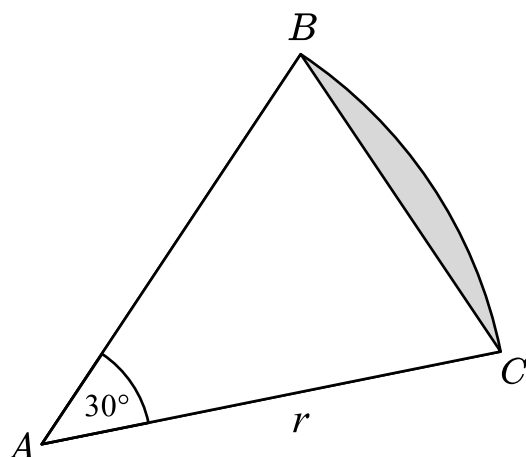
$$y \geq -3$$

$$2x + y < 2$$



[3]

19  $ABC$  is a sector of a circle.



The area of the shaded segment is  $3\pi - 9 \text{ cm}^2$ .

Find the radius of the circle,  $r$ .

.....  $\text{cm}$  [5]

- 20 (a)** The point  $(-3, 3\sqrt{5})$  lies on the circumference of a circle, centre  $(0, 0)$ .  
Find the equation of the circle.

----- [4]

- (b)** The equation of a different circle is  $x^2 + y^2 = 36$   
Does the point  $(3, 4)$  lie inside the circle?  
Show how you decide.

----- [3]

- 21** Show that  $\frac{10 - \sqrt{20}}{3 + \sqrt{5}}$  can be written in the form  $a + b\sqrt{5}$ , where  $a$  and  $b$  are integers.

[4]

- 
- 22**  $6x^2 + 13xy = 5y^2$  where  $x > 0$  and  $y > 0$ .

Find the ratio  $x : y$

----- [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