



THIRD SPACE
LEARNING

Mathematics

Paper 4

(Calculator)

Higher Tier

OCR GCSE

SET 2

Mathematics Paper 4 (Calculator) Higher Tier OCR 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 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.

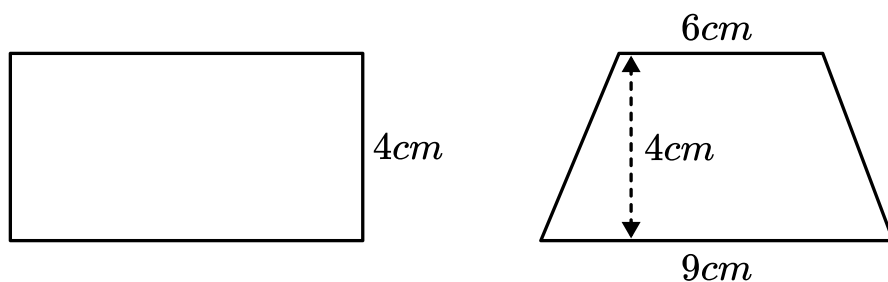
Advice

- 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.

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 Here are a rectangle and a trapezium.



The area of the rectangle is 40% greater than the area of the trapezium.

Work out the length of the rectangle.

..... cm [4]

- 2 A box holds 12 doughnuts.

It takes 500g of flour to make 20 doughnuts.

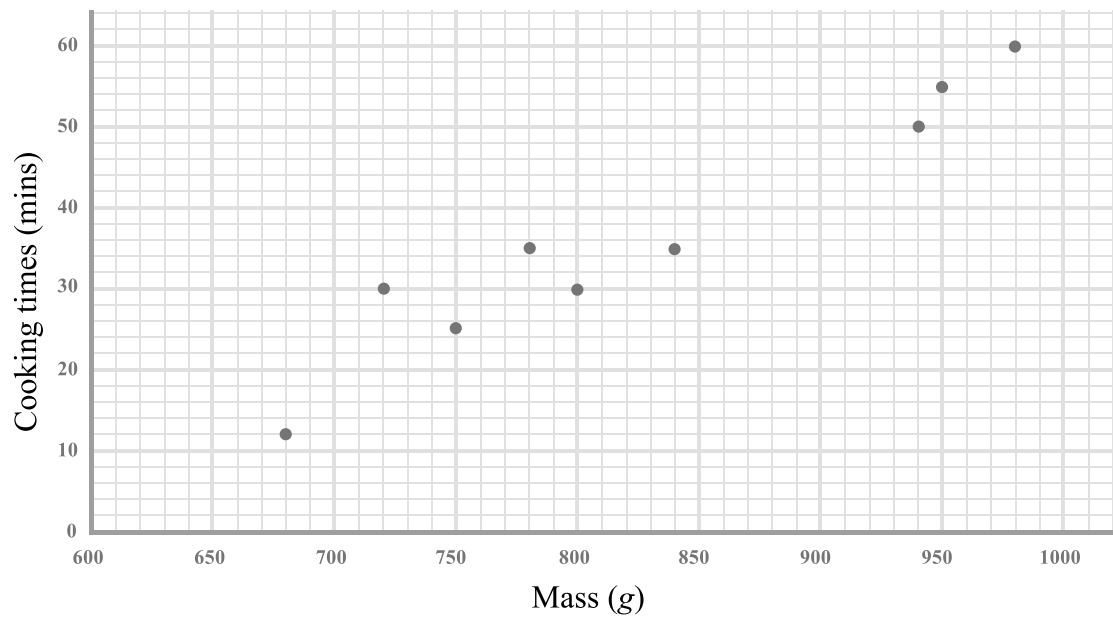
Linda needs to make 4 boxes of doughnuts and she has 1.5kg of flour.

Does Linda have enough flour to make 4 boxes of doughnuts?

You must show how you decide.

..... [4]

3 This scatter diagram shows information about the cooking times of a variety of cakes.



Here is some information about another three cakes.

Mass (g)	750	850	700
Cooking time (mins)	35	50	20

(a) Plot this information on the scatter diagram. [2]

(b) What type of correlation does this scatter diagram show?

(b) [1]

(c) (i) Draw a line of best fit on the diagram. [1]

(ii) Use your line of best fit to estimate the cooking time of a cake which weighs 900g.

(c) (ii) mins [1]

(d) Work out the fraction of cakes that take longer than 30 minutes to cook. [2]

Turn over

- 4 (a)** Richard and Ian are running around a track.

It takes Richard 63 seconds to complete a lap of the track.

It takes Ian 105 seconds to complete a lap of the track.

They both start running at the same time.

Work out how long it will be until they next both cross the start line together.

(a) seconds **[3]**

- (b)** Write down one assumption that was necessary to solve this problem.

.....

.....

[1]

- 5** Hollies buys 2 adult tickets and 3 child tickets for a show. She pays £35.
Betsy buys 3 adult tickets and 4 child tickets for the same show. She pays £49.50.

Calculate the cost of one adult ticket and the cost of one child ticket.
You must show your working.

Adult

Child

[5]

-
- 6 (a)** The ratio of women : men working for a company is 3:5.
15 women for the company. How many men work for the company?

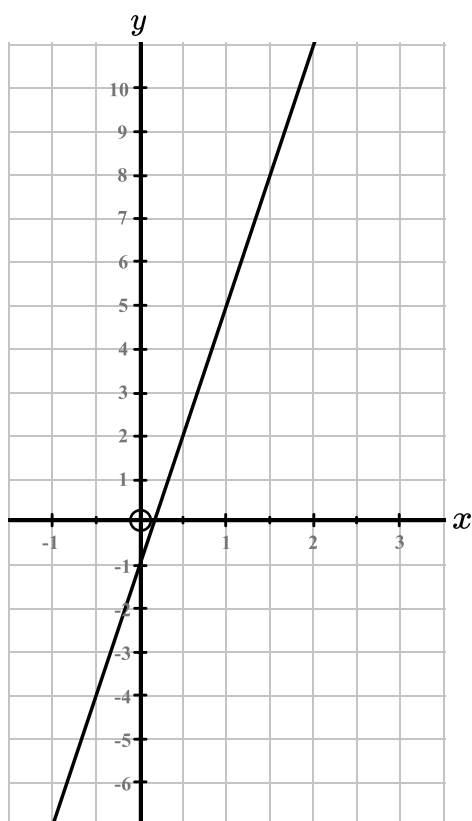
(a) **[2]**

- (b)** The company recruits some new employees.
There are 2 new men and some new women.
The ratio of women : men is now 2:3.
How many new women are there?

(b) **[3]**

Turn over

- 7 A line is drawn on the grid below.



- (a) Work out the gradient of the line.

(a) [2]

- (b) Write down the equation of the line.

(b) [1]

- (c) The line is continued up to the right. Will the line pass through the point (50, 151)?

Show how you decide.

because

.....

.....

[2]

- 8 ABCD is a quadrilateral made from two right angled triangles.

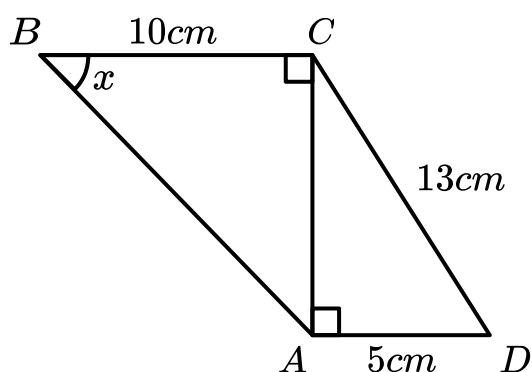


Diagram *NOT*
accurately drawn

Work out the size of angle x .

Give your answer to 1 decimal place.

..... [4]

- 9 Make m the subject of the formula $y = \frac{3m + 4}{5n}$

$m =$ [2]

Turn over

10 Rob wants to install solar panels.

Rob decides he will need 6 solar panels.

Each solar panel costs £350.

The other components required cost a total of £2400.

It will take 2 men 2 days to install the system.

The labour charge is £150 per man per day.

The average household with this system will save £1200 per year on electricity.

If Rob has this system installed, how long will it be until the money
he will have saved will be equal to the initial cost?

Give your answer in years and months.

----- years ----- months **[4]**

- 11 (a)** The price of train tickets in 2020 was 3.5% higher than in 2019.

The price of a ticket from Bristol to London in 2020 was £2.80 more than in 2019.

Work out the price of a train ticket from Bristol to London in 2019.

(a) **[2]**

- (b)** The price of train tickets increased by a further 3.5% per year for the following two years.

A train ticket from London to Sheffield in 2019 was £130.

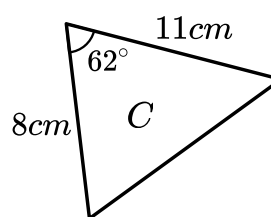
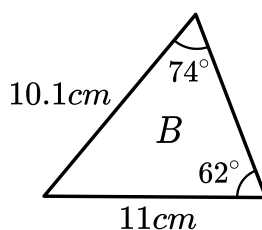
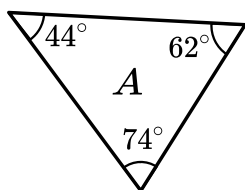
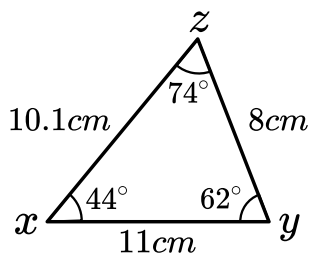
Work out the price of a train ticket from London to Sheffield in 2022.

(b) **[3]**

Turn over

12 Which of the triangles A, B or C is definitely congruent to triangle xyz ?

Give a reason for your answer?



because

[2]

13 (a) The n th term of a number sequence is $2n + 1^2$

Write down the first three terms in the sequence.

(a) [2]

(b) The first 5 terms of a different sequence are:

$$\frac{3}{1} \quad \frac{5}{4} \quad \frac{7}{9} \quad \frac{9}{16} \quad \frac{11}{25} \quad \dots$$

Find an expression, in terms of n , for the n th term of this sequence.

(b) [3]

14 Izzy rolls one die.

Jim rolls two dice and adds the values together.

Who is most likely to get a result of 6?

You must show how you decide.

----- [4]

15 Correct to the nearest mm , the length of a side of a regular pentagon is $3.8cm$.

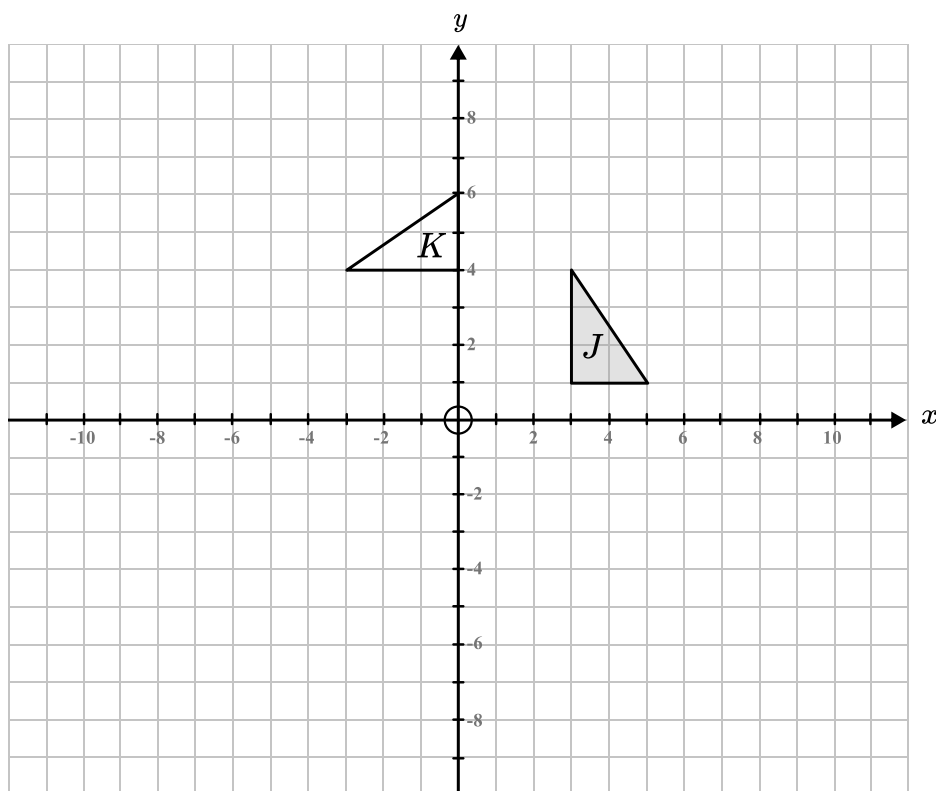
Work out an upper bound for the perimeter of the pentagon.

Give your answer in cm .

----- cm [2]

Turn over

16 Triangle J and triangle K are drawn on the coordinate grid.



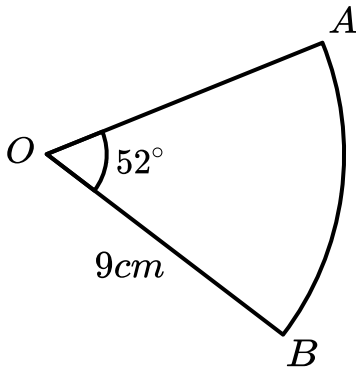
(a) Describe fully the single transformation that maps triangle J onto triangle K.

[3]

(b) Enlarge shape J by scale factor -2 from the centre of enlargement $(0, 0)$.

[2]

- 17 The diagram shows the sector OAB.



Angle AOB = 52° .

The radius of the circle is 9cm .

Calculate the perimeter of the sector.

Give your answer to 1 decimal place.

..... cm [3]

Turn over

18 Katie and Nelly each have a combination padlock.

Each padlock has four dials.

On Katie's padlock, each dial contains the digits 0 – 8.

On Nelly's padlock, each dial contains the digits 0 – 9.

How many more possible code combinations could be selected on Nelly's padlock than on Katie's padlock?

----- [3]

19 Paddy has two jugs of lemonade.

Jug A contains 600ml of lemonade which he made using syrup and sparkling water in the ratio 1:3.

Jug B contains 1.4 litres of lemonade which he made using syrup and sparkling water in a different ratio.

Paddy mixes the two jugs of lemonade, giving him a total of 2 litres.

He calculates that the ratio of syrup to sparkling water in the mixed lemonade is 11:29.

Work out the ratio of syrup to sparkling water for the lemonade that was in jug B.

----- : ----- [4]

20 (a) Solve $4x^2 = 8x + 7$

Give your solutions to 2 decimal places.

(a) **[3]**

(b) Solve $\frac{2^{2x}}{2^3} = 32$

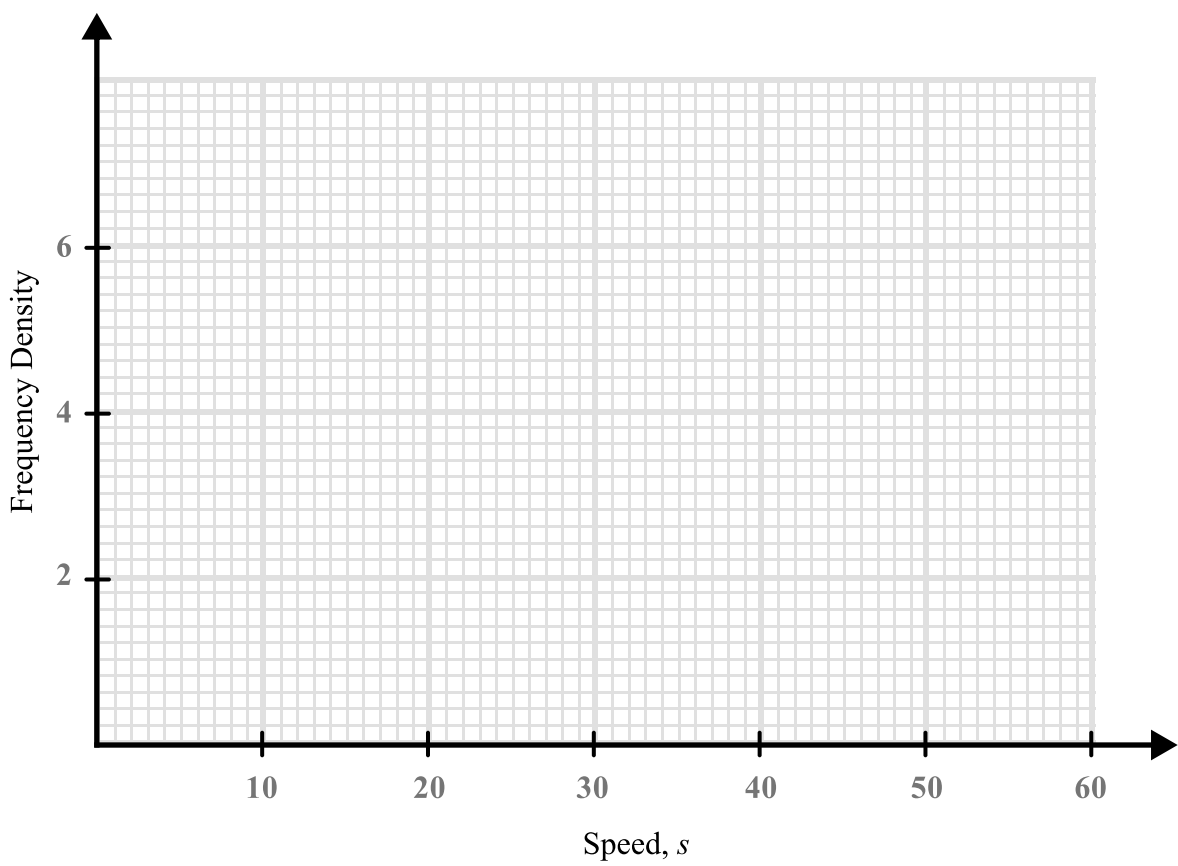
(b) **[3]**

Turn over

21 This table shows information about the speed, in mph, of some cars as they travelled past a speed camera.

Speed, (s mph)	Frequency	
$0 \leq s < 30$	12	
$30 \leq s < 35$	22	
$35 \leq s < 45$	34	
$45 \leq s < 60$	3	

(a) On the grid below, draw a histogram to represent this information.



[3]

(b) What do you think the speed limit on this road is?

Tick the appropriate box and give a reason for your answer.

☐

30mph

☐

40mph

☐

60mph

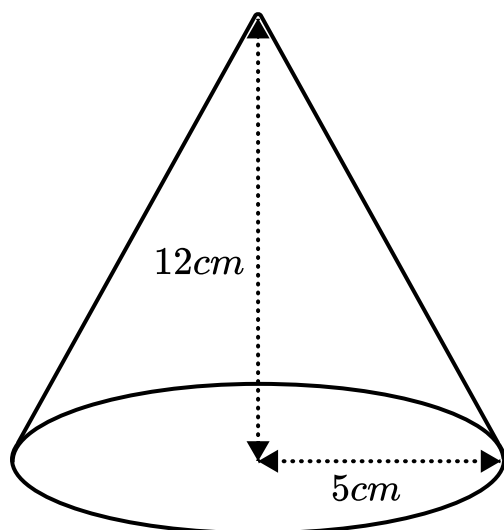
[1]

22 Prove that $2n(n + 4) + (n - 4)^2$ is positive for all value of n .

[3]

Turn over

23 Here is a cone.



- (a)** The volume of a cone is calculated using the formula $V = \frac{1}{3} \pi r^2 h$. Work out the volume of the cone.
Give your answer to 1 decimal place.

(a) cm^2 [2]

- (b)** A larger cone is mathematically similar to this cone.
It has a surface area which is 4 times greater than the surface area of this cone.
Work out the volume of the larger cone.
Give your answer to the nearest integer.

(b) [3]

- 24** A helicopter flies 18km from the airport, A, to point B on a bearing of 035° .
The helicopter then flies from point B to point C on a bearing of 130° .
Finally, the helicopter flies back to the airport on a bearing of 250° .
Work out the distance from A to C.
Give your answer to 1 decimal place.

----- *km* **[5]**

END OF QUESTION PAPER

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