



THIRD SPACE
LEARNING

Mathematics

Paper 2

(Calculator)

Higher Tier

AQA GCSE

SET 2

Mathematics Paper 2 (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 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 word which correctly describes $3x + 5x = 8x$

[1 mark]

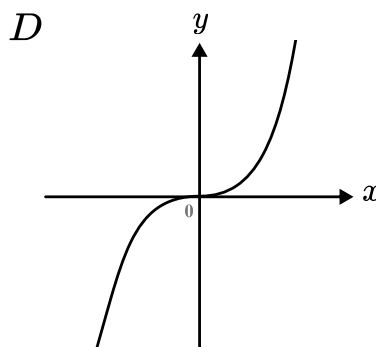
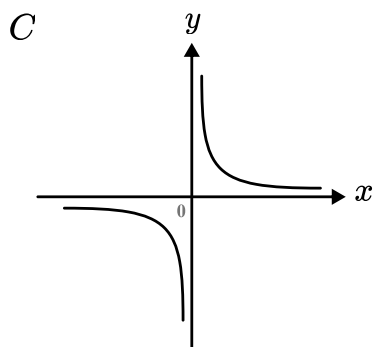
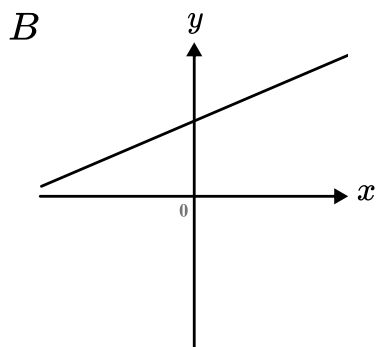
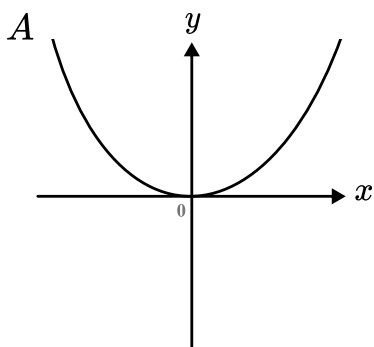
Equation

Expression

Identity

Formula

2 Here are four graphs.



Circle the letter of the graph that could have equation $y = \frac{3}{x}$

[1 mark]

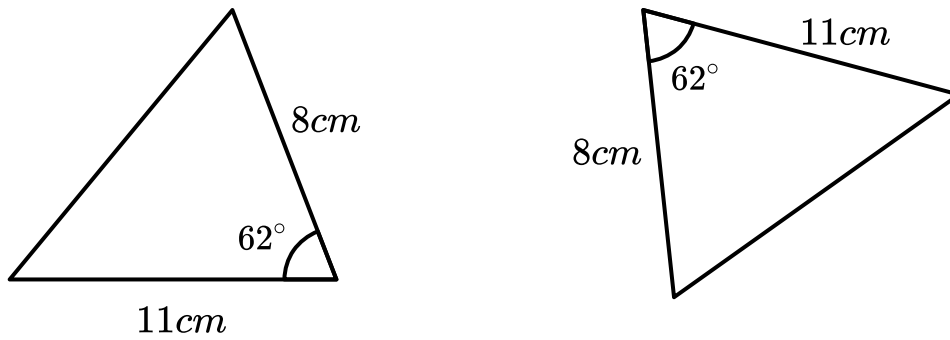
A

B

C

D

3



Circle the reason why these triangles are congruent.

[1 mark]

ASA

SAS

SSS

RHS

4 y is $2\frac{1}{2}$ times x .

Circle the ratio that is equivalent to $x : y$.

[1 mark]

2:5

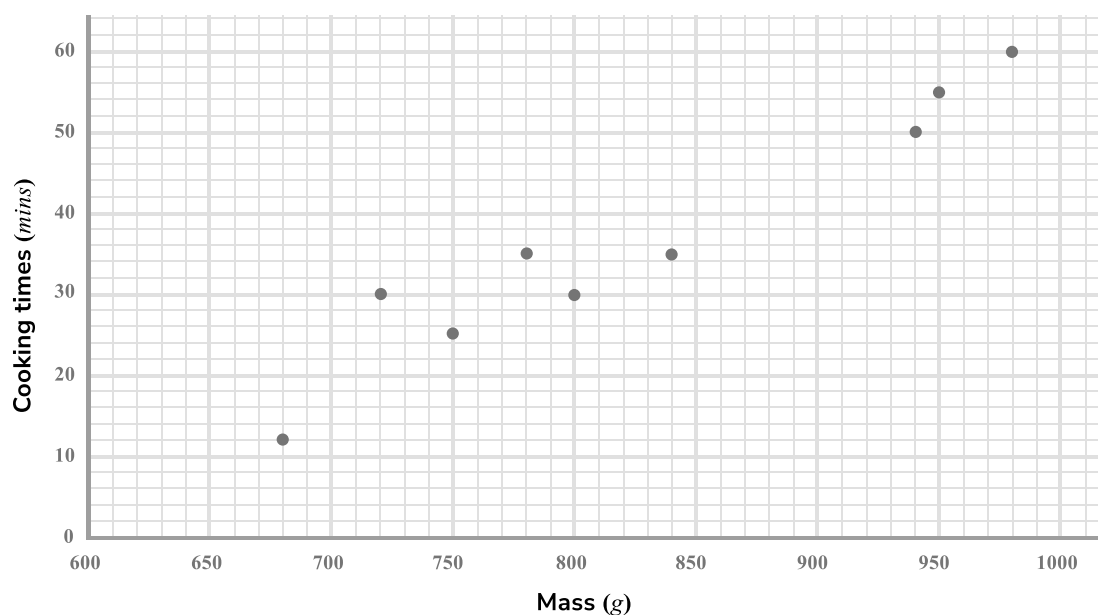
5:2

7:2

2:7

Turn over for the next question

- 5 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

- 5(a) Plot this information on the scatter diagram.

[1 mark]

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

[1 mark]

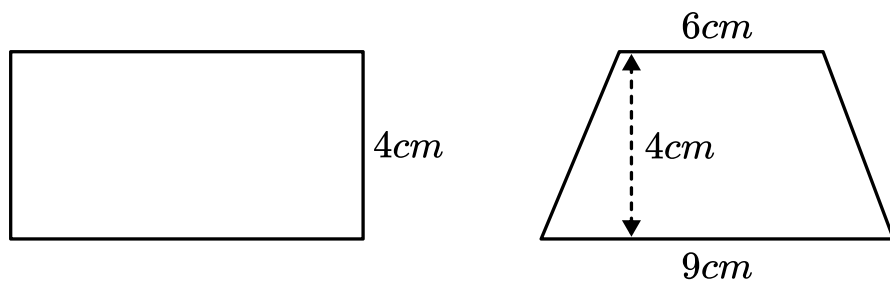
Answer _____

- 5(c) Use the scatter diagram to estimate the cooking time of a cake which weighs 900g.

[1 mark]

Answer _____

- 6 Here is 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.

[4 marks]

Answer _____

Turn over for the next question

7 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 marks]

Answer _____

8 Solve the simultaneous equations,

$$3a + 2b = 20$$

$$4a - 3b = 12.5$$

[3 marks]

$a =$ _____

$b =$ _____

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

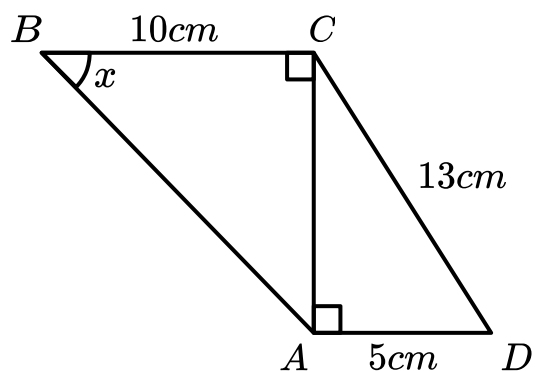


Diagram *NOT*
accurately drawn

Work out the size of angle x .

Give your answer to 1 decimal place.

[4 marks]

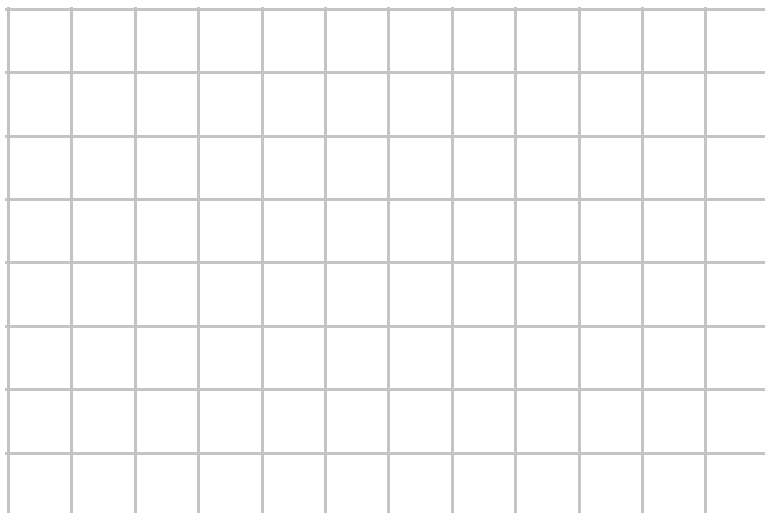
Answer _____

10 Here are two column vectors.

$$\mathbf{a} = \begin{pmatrix} 3 \\ 1 \end{pmatrix} \quad \mathbf{b} = \begin{pmatrix} -1 \\ 2 \end{pmatrix}$$

On the grid below, draw and label the vector $2\mathbf{a} + \mathbf{b}$

[3 marks]



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

[2 marks]

$$m = \underline{\hspace{10cm}}$$

12 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.

[4 marks]

Answer _____ years _____ months

13(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.

[2 marks]

Answer _____

13(b) The price of train tickets increased by a further 3.5% per year for the following three 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.

[3 marks]

Answer _____

14 Izzy rolls one die.

Jim rolls two dice and adds the values together.

Tick the appropriate box.

You must show how you decide.

[4 marks]

☐

Izzy is more
likely to get a 6

☐

Jim is more
likely to get a 6

☐

Izzy and Jim are equally
likely to get a 6

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*.

[2 marks]

Answer _____

16 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?

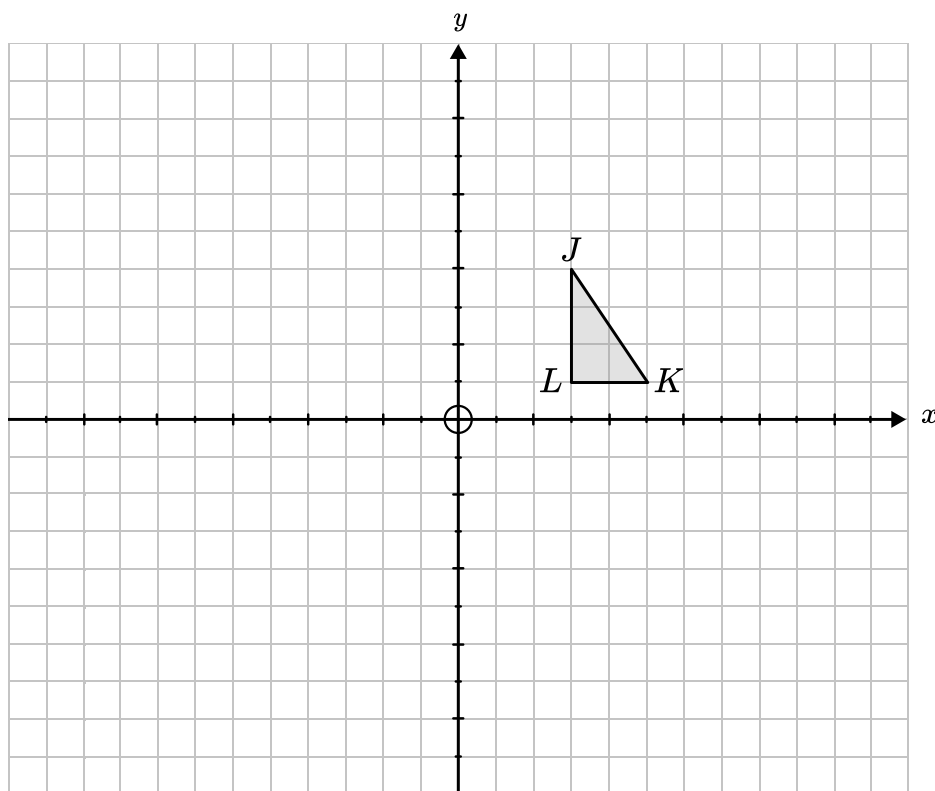
[3 marks]

Answer _____

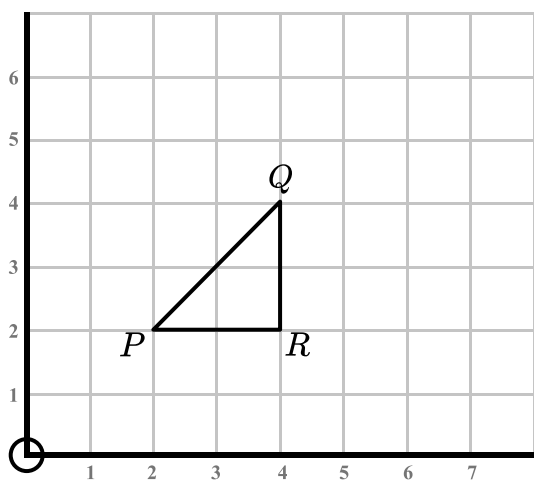
Turn over for the next question

17(a) Enlarge shape JKL by scale factor -2 from the centre of enlargement $(0, 0)$.

[2 marks]



17(b) Triangle PQR is shown below.



When PQR is reflected in a line, Q and R are invariant points.
Circle the equation of the line.

[1 mark]

$y = x$

$y = -x$

$x = 4$

$y = 2$

18(a) The n th term of a number sequence is $an^2 + bn$.

Write down an expression in terms of a and b for the third term in the sequence.

[1 mark]

Answer _____

18(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.

[3 marks]

Answer _____

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 marks]

Answer _____

20 The mean age of the 20 members of a club is x .

A new member joins the club. The new member's age is y .

Circle the expression which gives the new mean age of the club members.

[1 mark]

$$\frac{x+y}{2}$$

$$\frac{x+y}{21}$$

$$\frac{20x+y}{21}$$

$$\frac{20xy}{21}$$

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

Give your solutions to 2 decimal places.

[3 marks]

Answer _____

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

[3 marks]

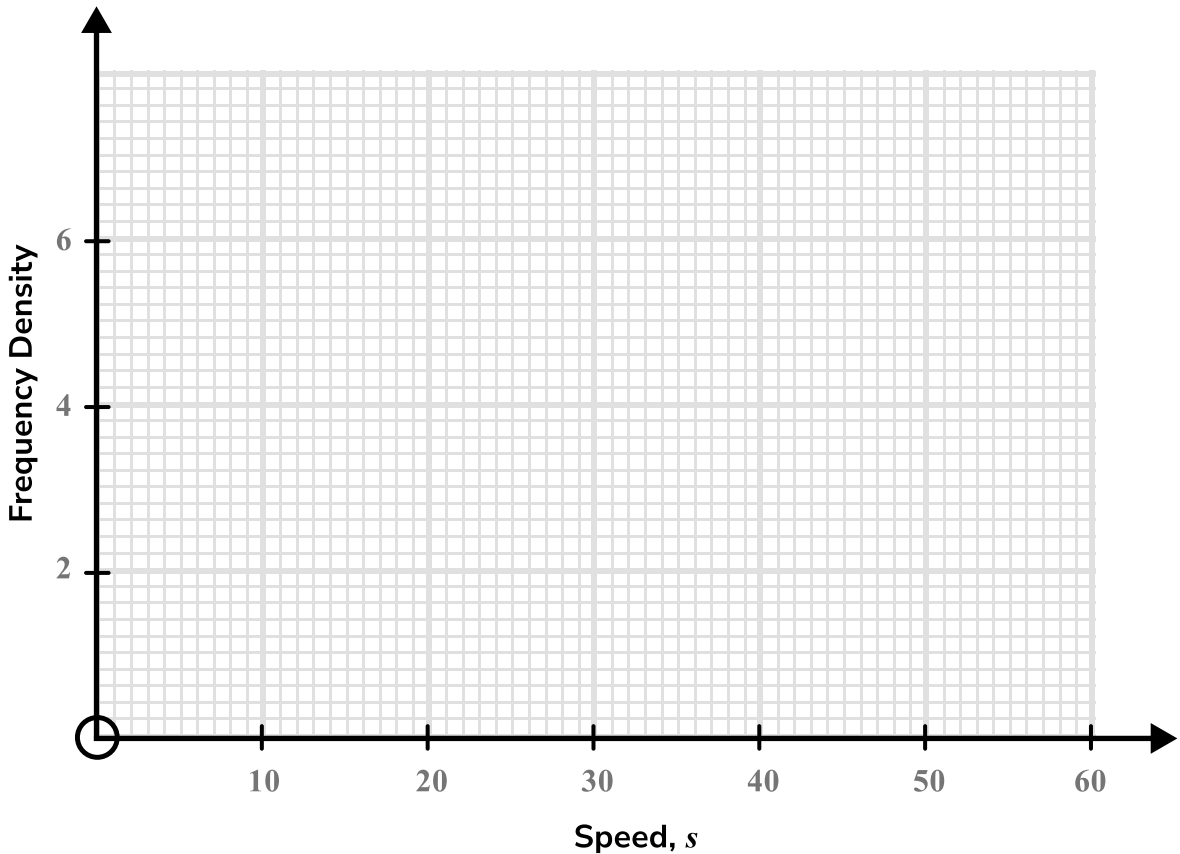
Answer _____

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

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

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

[3 marks]



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

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

[1 mark]

☐

30mph

☐

40mph

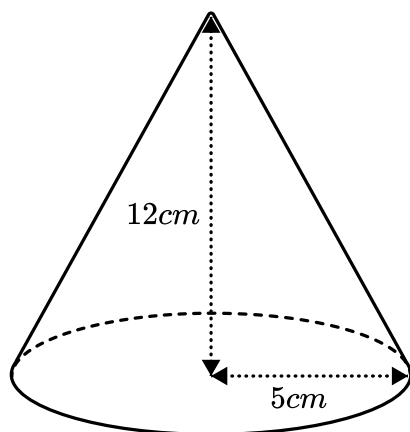
☐

60mph

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

[3 marks]

24 Here is a cone.



24(a) Work out the volume of the cone.

Give your answer to 1 decimal place.

[2 marks]

Answer _____ cm^3

24(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.

[3 marks]

Answer _____ cm^3

- 25** 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.

[5 marks]

Answer _____

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