Mathematics Paper 2 (Calculator) Higher Tier

Edexcel GCSE

SET 2

Mathematics Paper 2 (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 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 This scatter diagram shows information about the cooking times of a variety of cakes.
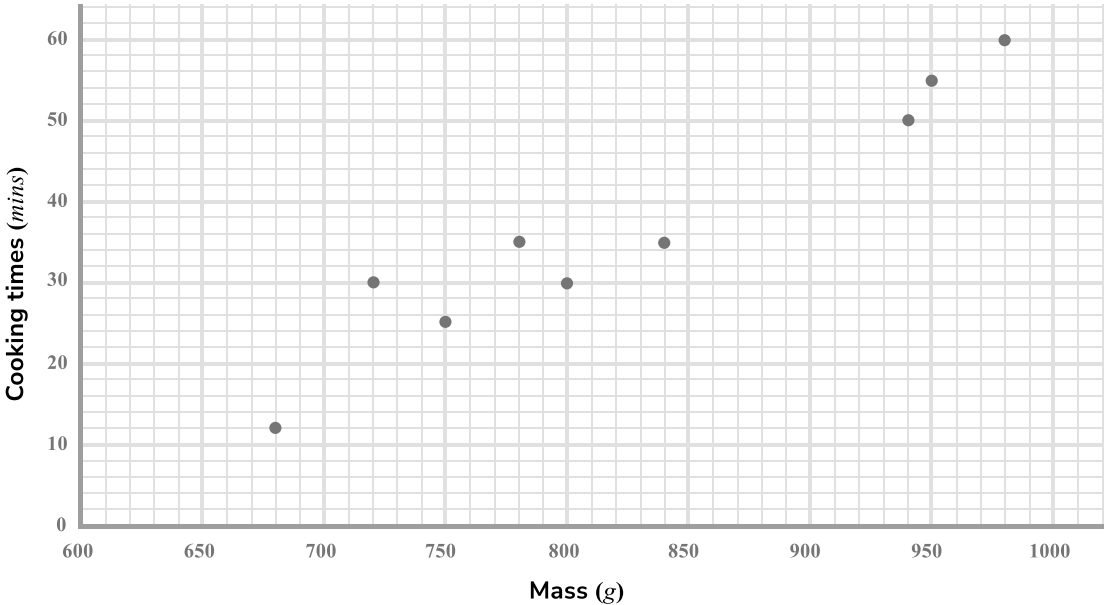
Here is some information about another three cakes.

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

(a) Plot this information on the scatter diagram.

(2)

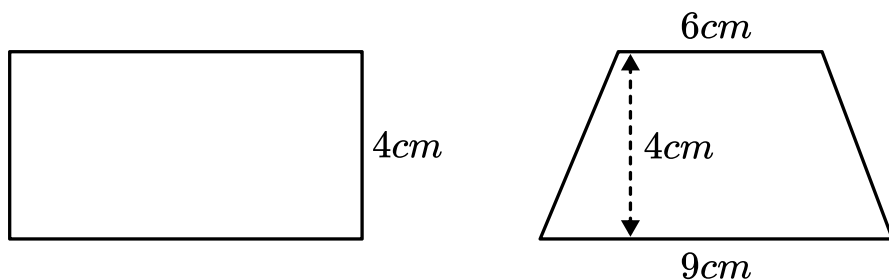(b) What type of correlation does this scatter diagram show?

----

(1)

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

-- mins

(2)

(Total for Question 1 is 5 marks)

2 Here is a rectangle and a trapezium.

6*cm*

4*cm*

4*cm*

9*cm*

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

Work out the length of the rectangle.

cm

(Total for Question 2 is 4 marks)

3 A box holds 12 doughnuts.

It takes 500*g* of flour to make 20 doughnuts.

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

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

You must show how you decide.

(Total for Question 3 is 4 marks)

4   Solve the simultaneous equations,

$3a + 2b = 20$

$4a - 3b = 12.5$

(Total for Question 4 is 3 marks)

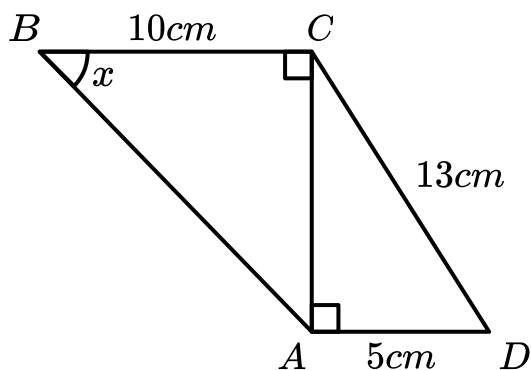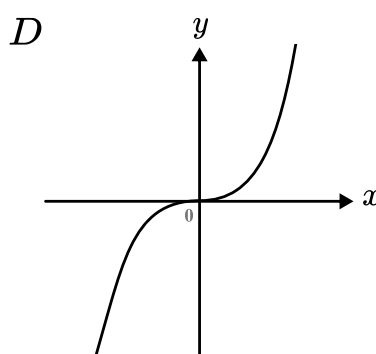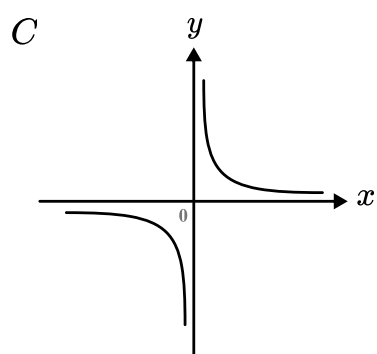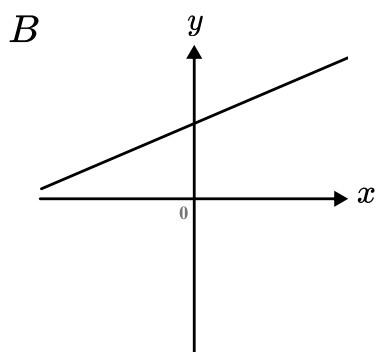**5**   ABCD is a quadrilateral made from two right angled triangles.
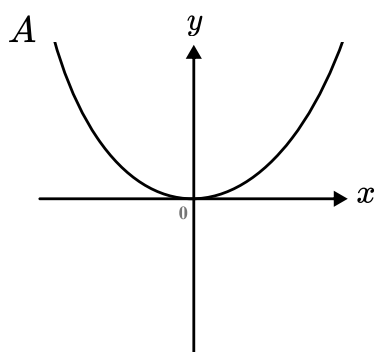

Diagram NOT accurately drawn

Work out the size of angle x.

Give your answer to 1 decimal place.

(Total for Question 5 is 4 marks)

6   Here are four graphs.

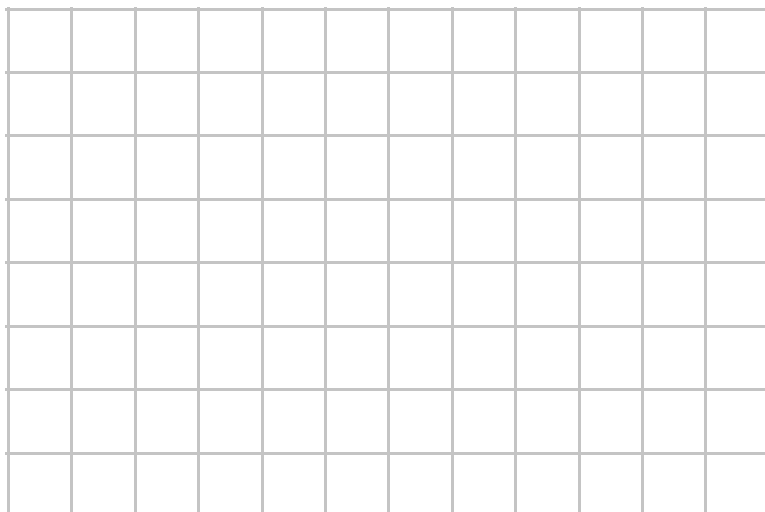Write down the letter of the graph that could have equation:

$y = \dfrac{1}{2}x + 3$	
$y = x^3$	
$y = \dfrac{1}{x}$	

(Total for Question 6 is 3 marks)

7 Here are two column vectors.

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

On the grid below, draw and label the vector 2*a* + *b*

(Total for Question 7 is 3 marks)

---

8 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

(Total for Question 8 is 4 marks)

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

$m =$ _____

(Total for Question 9 is 2 marks)

10 (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)

(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)

(Total for Question 10 is 5 marks)

11 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.

(Total for Question 11 is 4 marks)

12 (a) The nth term of a number sequence is $2n^2 + 1$.

Write down the first three terms in the sequence.

(2)

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

$$\frac{3}{1} \qquad \frac{5}{4} \qquad \frac{7}{9} \qquad \frac{9}{16} \qquad \frac{11}{25} \qquad ...$$

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

(3)

(Total for Question 12 is 5 marks)

13 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?

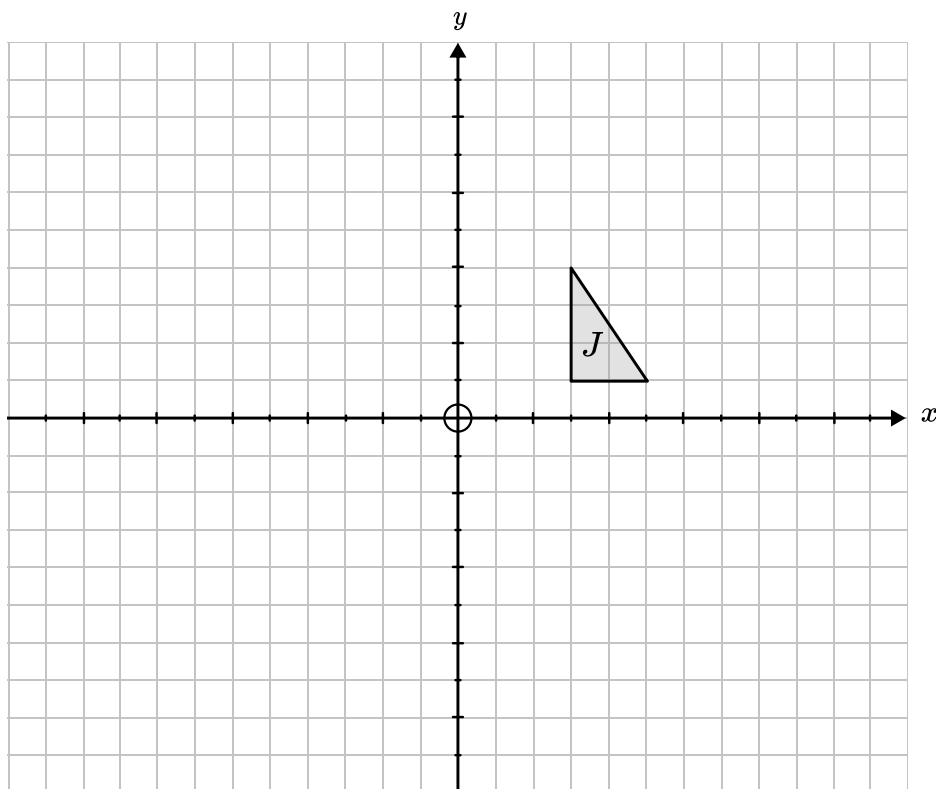**(Total for Question 13 is 3 marks)**

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

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

Give your answer in *cm*.

cm

(Total for Question 14 is 2 marks)

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

(Total for Question 15 is 2 marks)

16 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 sparking water for the lemonade that was in jug B.

(Total for Question 16 is 4 marks)

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

Give your solutions to 2 decimal places.

- -

(3)

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

- -
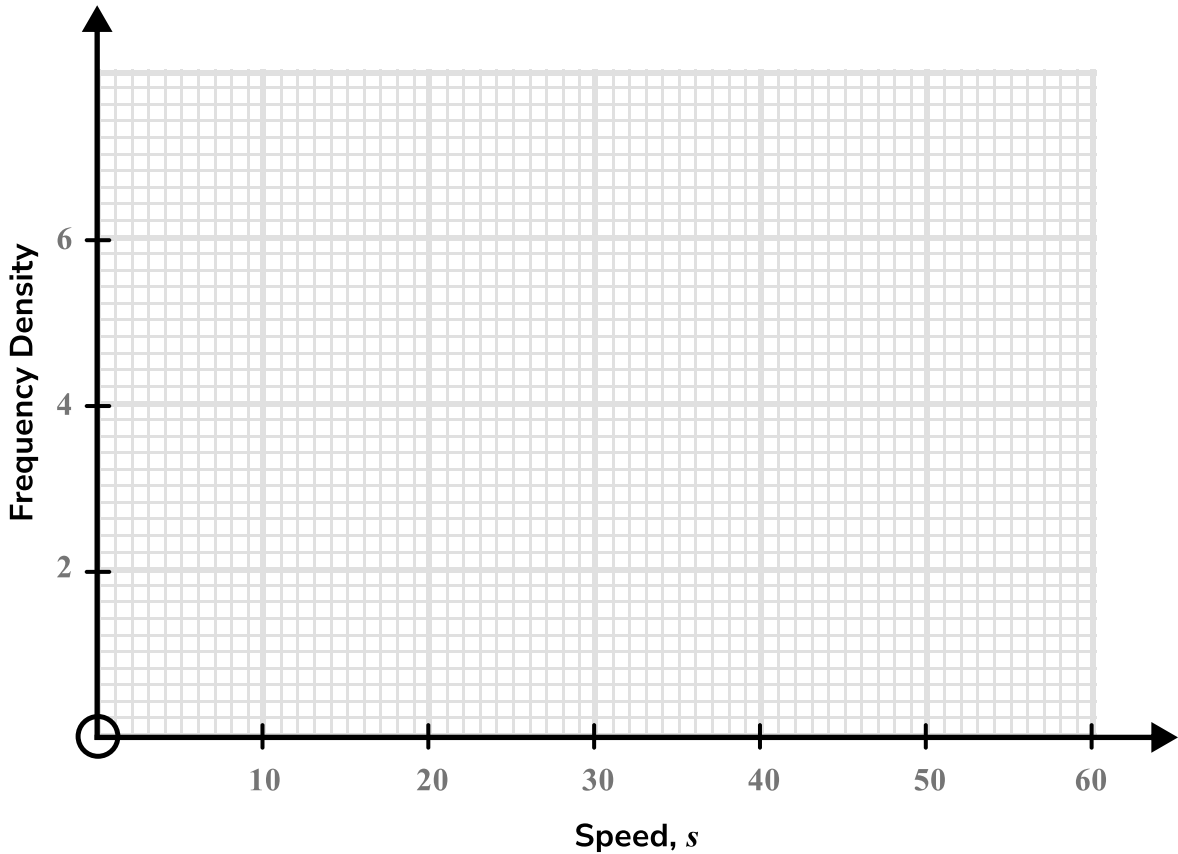
(3)

(Total for Question 17 is 6 marks)

18 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.

(1)

☐ 30mph

☐ 40mph

☐ 60mph

- -

- -

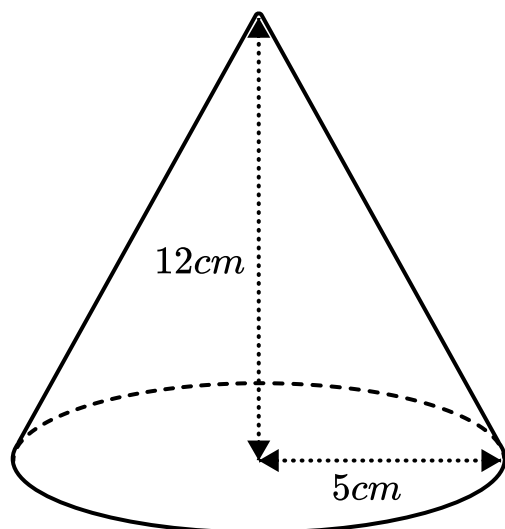**(Total for Question 18 is 4 marks)**

19 Here is a cone.

(a) Work out the volume of the cone.

Give your answer to 1 decimal place.

cm^3

....

(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.

....

(3)

(Total for Question 19 is 5 marks)

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

(Total for Question 20 is 3 marks)

21 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.

(Total for Question 21 is 5 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

🔍 thirdspacelearning.com

📞 0203 771 0095

THIRD SPACE
LEARNING