MME

GCSE MATHEMATICS
AQA | Edexcel | OCR | WJEC

Quadratics And Harder Graphs

Please write clearly in block capitals

Forename:
Surname:

Materials

For this paper you must have:
- mathematical instruments

You **can** use a calculator.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.
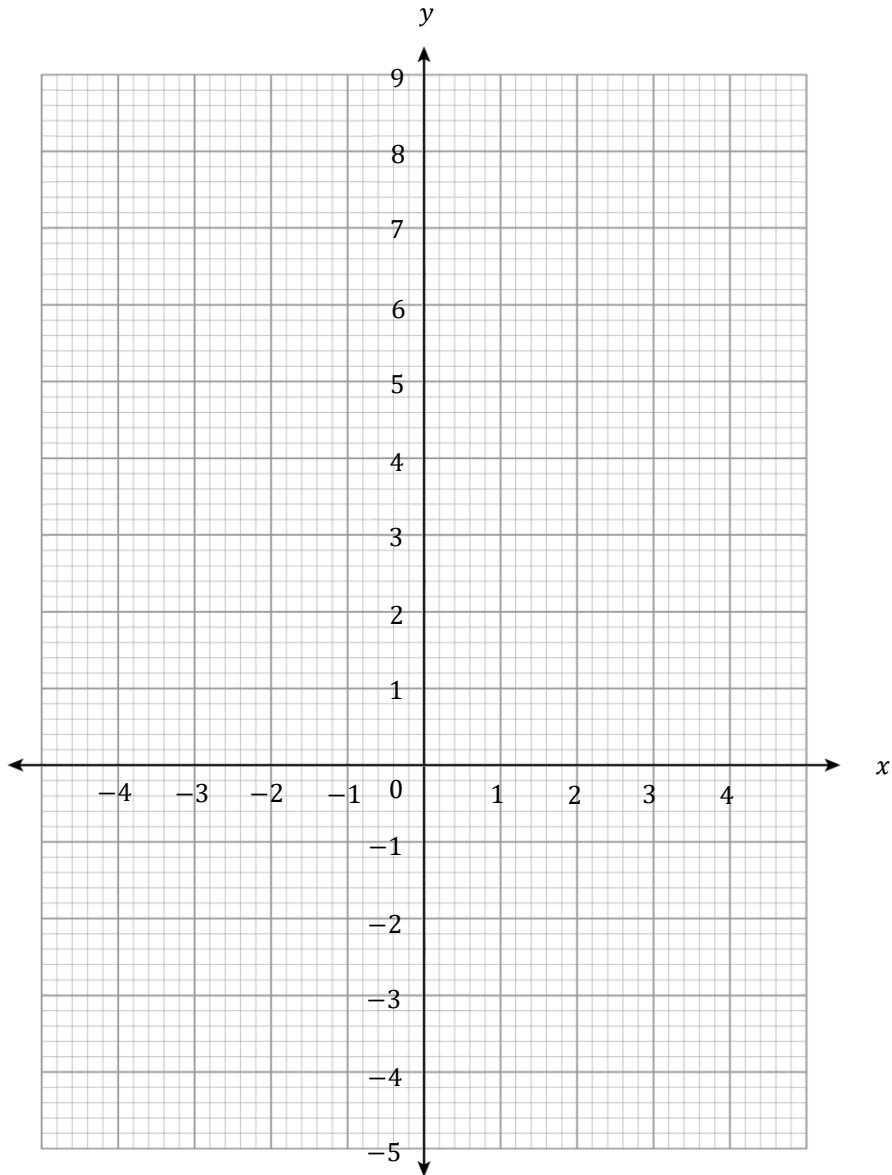
Advice

- In all calculations, show clearly how you work out your answer.

1   Complete the table, and plot the graph of $y = x^2$ on the axes below.
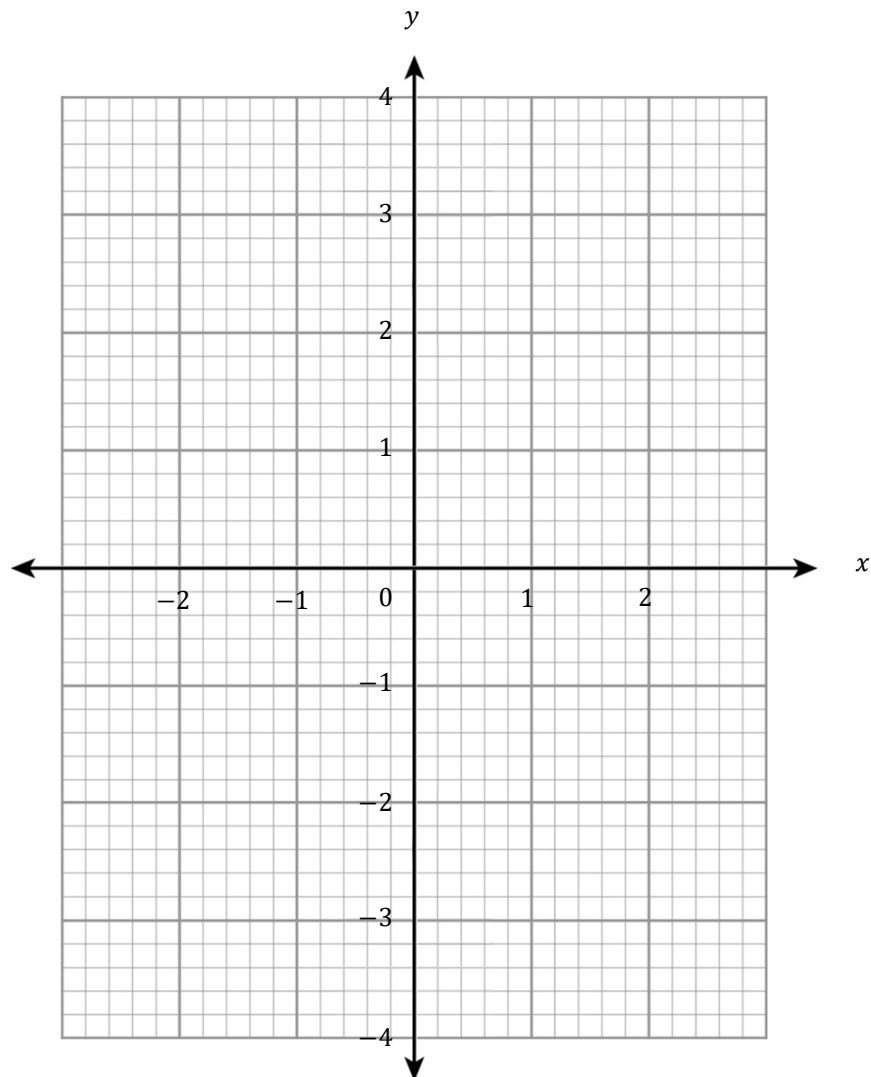
[2 marks]

x	-3	-2	-1	0	1	2	3
y						4	9

Turn over for next question

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2 Plot the graph of $y = x^3 - 2x$ for $-2 \leq x \leq 2$ on the axes below.

[3 marks]

x	-2	-1	0	1	2
y					

Turn over for next question

Turn over ▶

3 On the axes below, plot the graphs of the quadratics for $-2 \leq x \leq 3$

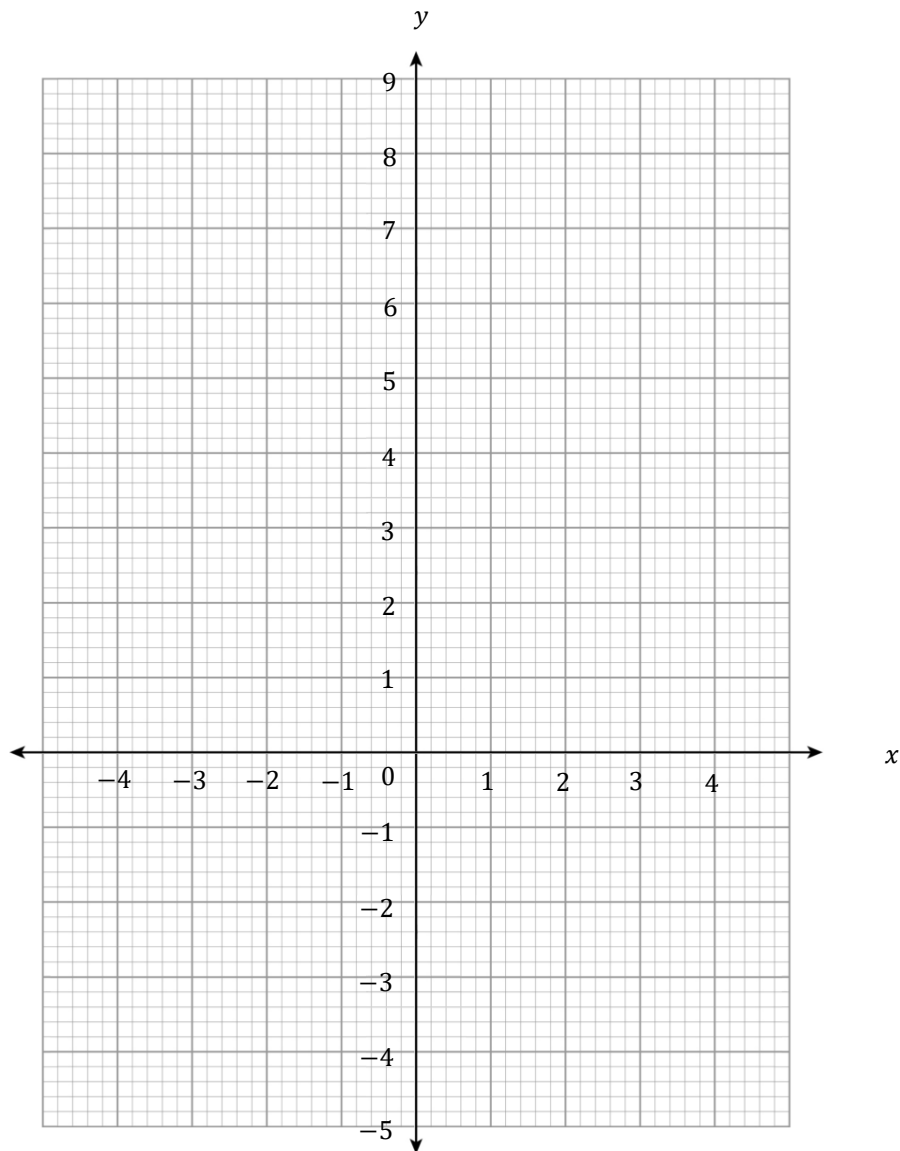$$A: \quad y = x^2 - 1$$
$$B: \quad y = x^2 - x$$

[5 marks]

x	−2	−1	0	1	2	3
y						

x	−2	−1	0	1	2	3
y						

Turn over for next question

5

4 A is a cubic graph, B is a reciprocal graph, their equations are shown below.

$$A: \quad y = x^3 - 1$$
$$B: y = \frac{1}{x}$$

4(a)   Complete the table below showing the values of A for $-2 \leq x \leq 2$

[2 marks]

x	-2	-1	0	1	2
y					

_____

_____

_____

4(b)   Complete the table below showing the values of B for $-2 \leq x \leq 2$

[2 marks]

x	-2	-1	-0.5	-0.25	0	0.25	0.5	1	2
y					Undefined				

_____

_____

_____

_____

Question continues on next page.

4

Turn over ►

4(c) On the axes below, plot graph A and graph B.

Label your graphs.

[3 marks]
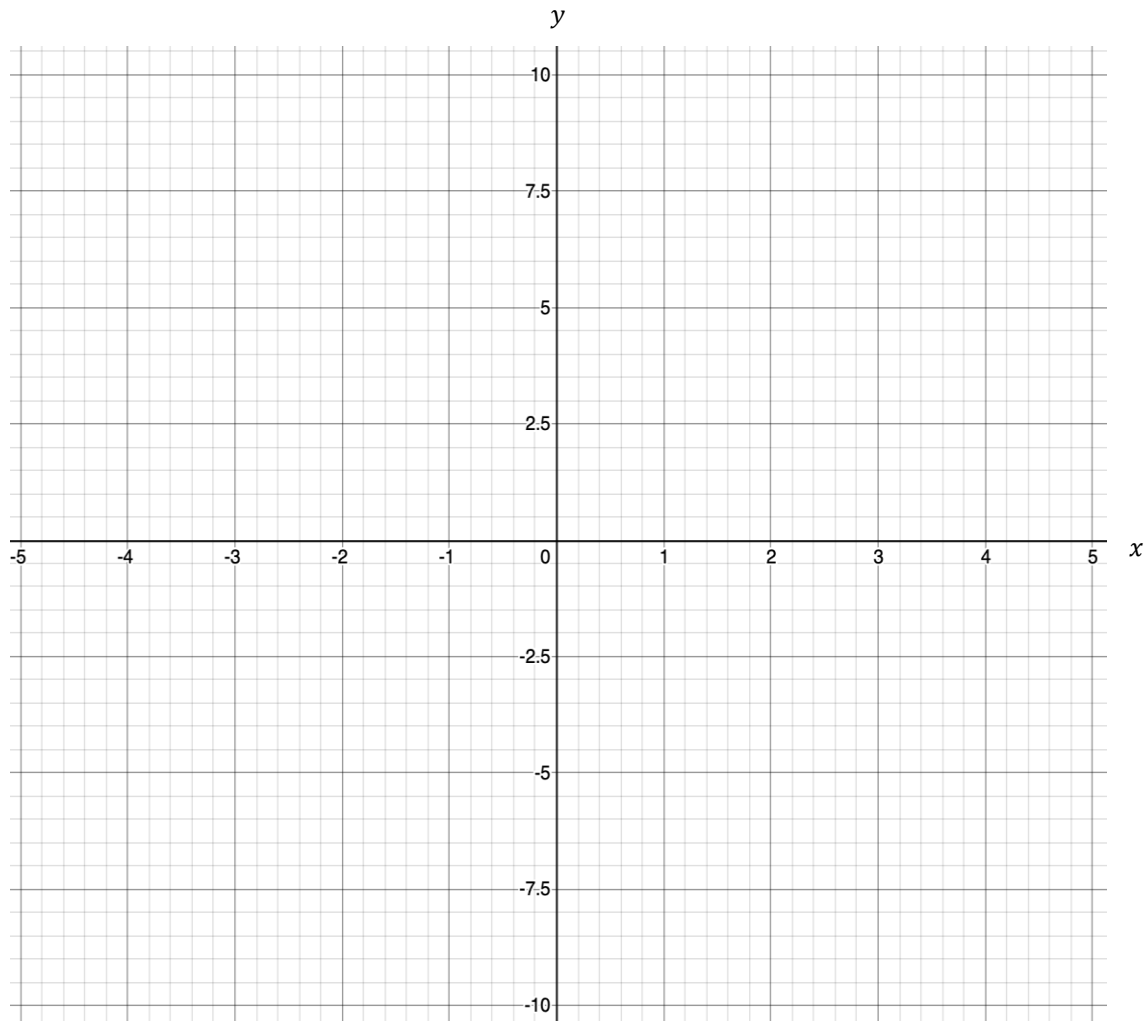
4(d) What are the approximate points of intersection of the two graphs?

[2 marks]

_____

_____

Answer _____

Turn over for next question

5

Turn over ▶

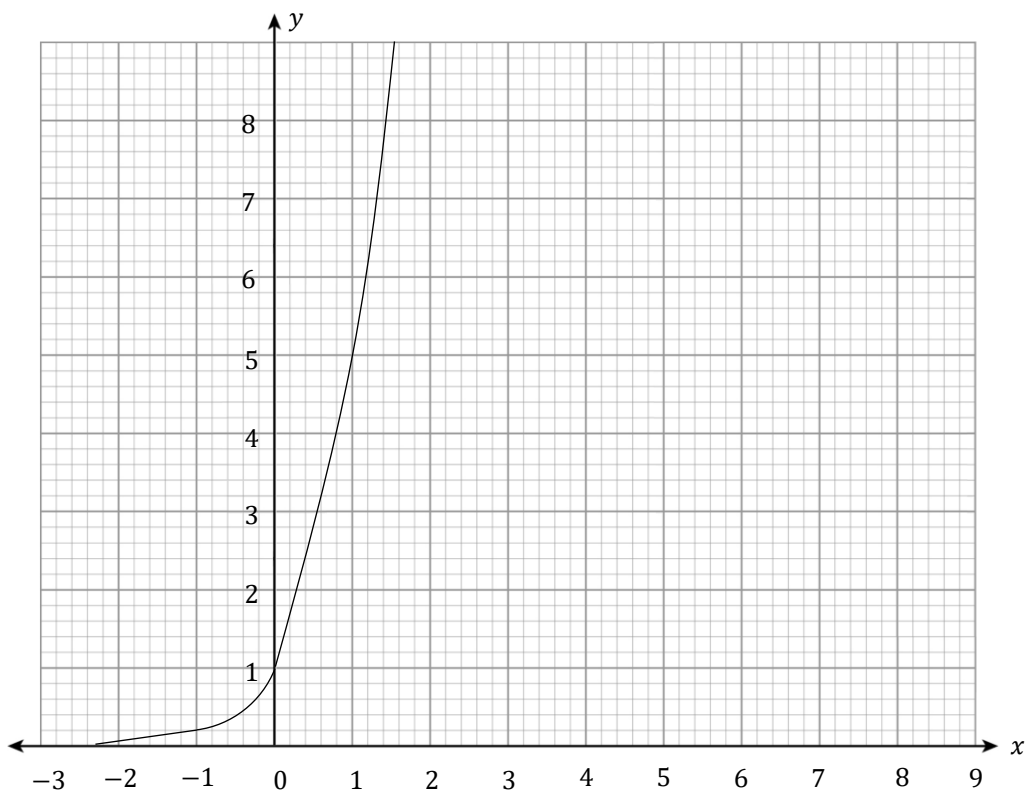**5** The graph below shows the graph of,

$$y = 5^x$$

5(a) Complete the table below showing the values of $y = 2^x$ for $-2 \leq x \leq 3$

[2 marks]

x	-2	-1	0	1	2	3
y						

5(b) Plot $y = 2^x$ on the axes below for the values of $-2 \leq x \leq 3$

[2 marks]

5(c) Describe the differences between the two graphs, making sure to include reference to the shape of each curve and any points of intersection.

[3 marks]

_____

_____

Answer _____

Turn over for next question

Turn over ▶

6(a) What is the difference between a sketch and a plot of a graph?

[1 mark]

_____

_____

Answer _____

6(b) Sketch the curves $y = \frac{1}{x}$ and $y = 2x + 1$ on the same axes.

[2 marks]

y

x

Turn over for next question

3
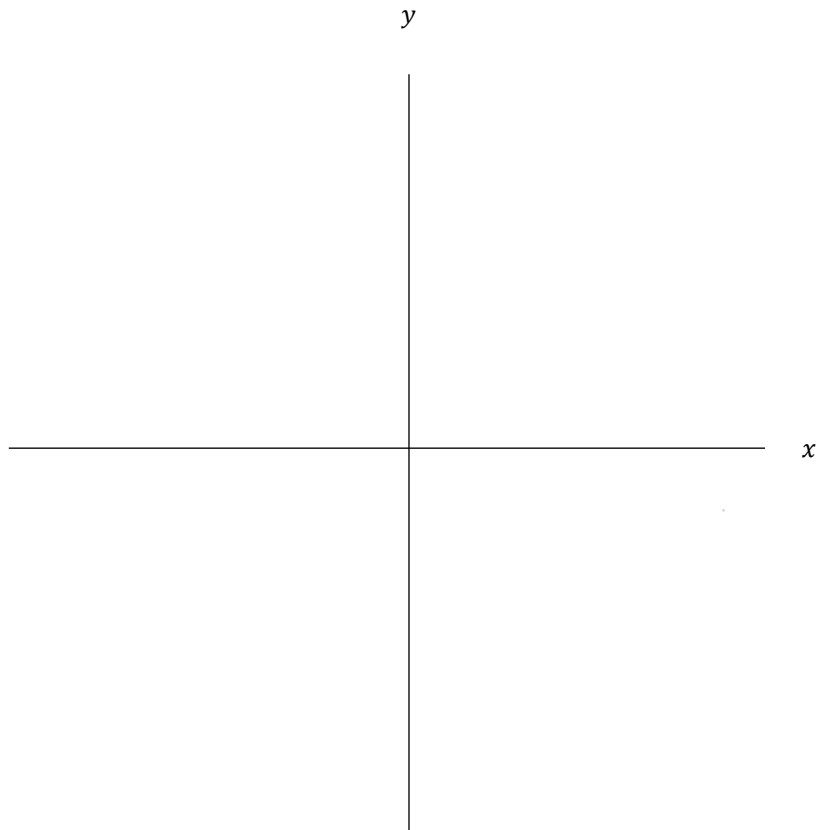
Turn over ▶

7 Match the sketches of the six graphs below to the equations given.

One has been done for you.

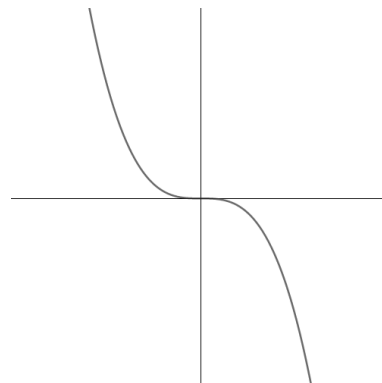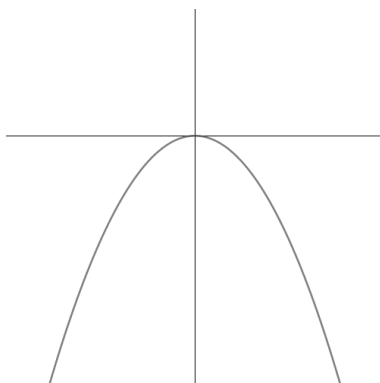A: $y = x^3 + 2x^2$ $\qquad$ B: $y = x^3$ $\qquad$ C: $y = -x^3$

D: $y = x^2$ $\qquad$ E: $y = x^2 + 2x$ $\qquad$ F: $y = -x^2$

[5 marks]

$\boxed{D}$

$\boxed{}$

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Turn over ▶

5
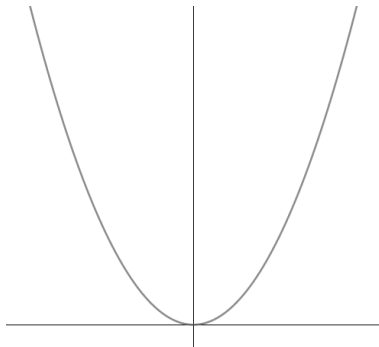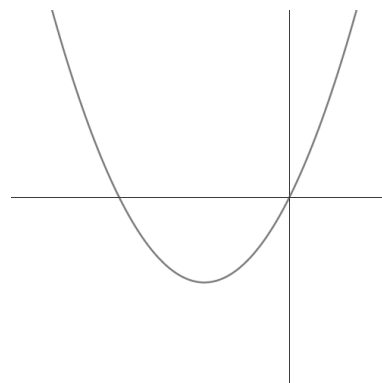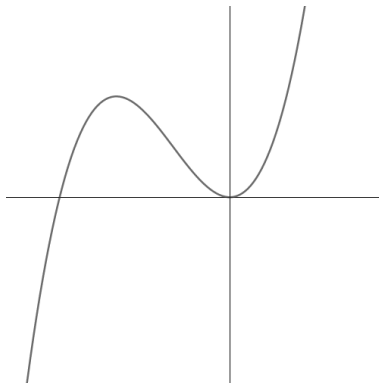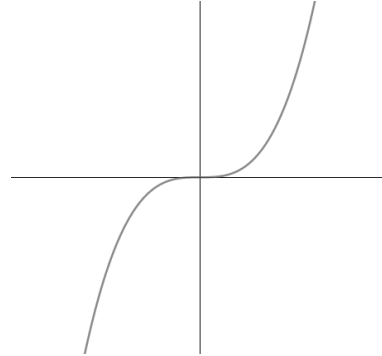
8 The grid below shows the graph of $N = Ar^t$ which represents the number of bacteria in a sample (N) over a period of time (t). A and r are constants.

N
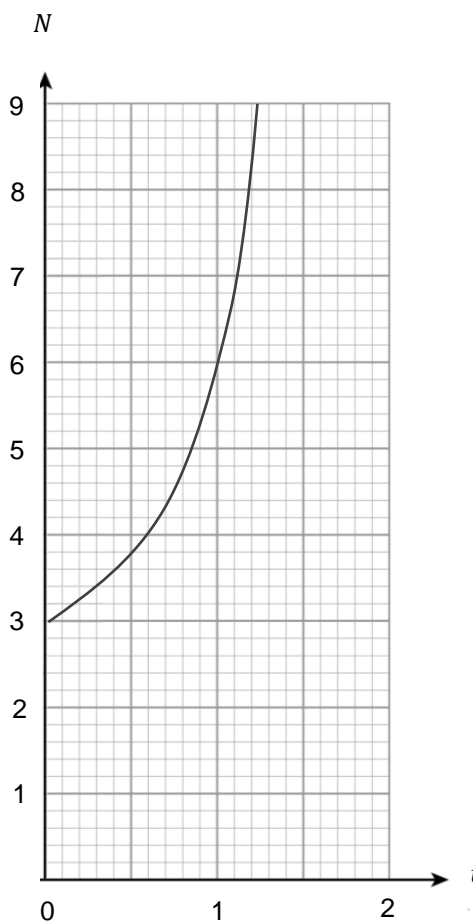
Use the graph to find the values of the constants A and r.

[3 marks]

Answer _____

Turn over for next question

3

Turn over ▶

9 Match the sketches of the six graphs below to the equations given.

One has been done for you.
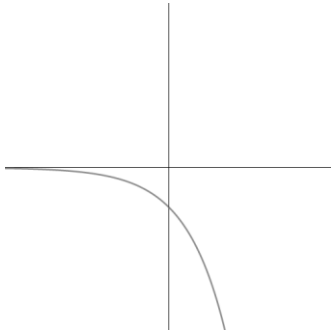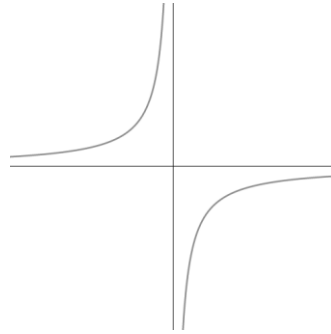
$$A: y = \frac{1}{x} \qquad B: y = -\frac{1}{x} \qquad C: y = \frac{1}{10x}$$

$$D: \; y = e^x \qquad\qquad E: \; y = 0.5^x \qquad\qquad F: \; y = -e^x$$

[5 marks]

□

B

□

□

□

□

5