Name: _____

Maths Genie Stage 8

Test B

Instructions

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- **Calculators may be used.**

Information

- 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

1   The cost of a council tax bill increased by 6%.
The council tax bill increased by £78.

Work out the cost of the council tax bill before the increase.

$$£78 = 6\%$$
$$\div 6 \qquad \div 6$$
$$£13 = 1\%$$
$$\times 100 \qquad \times 100$$
$$£1300 = 100\%$$

£ _1300_

(Total for Question 1 is 2 marks)

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2   (a) Write 7.28×10^6 as an ordinary number.

_7 280 000_

(1)

(b) Write 0.00501 in standard form.

5.01×10^{-3}

(1)

(c) Calculate $(1.09 \times 10^5) \div (4.36 \times 10^{-3})$
Give your answer in standard form.

_25 000 000_

2.5×10^{7}

(2)

(Total for Question 2 is 4 marks)

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3   A piece of gold has a mass of 722 grams and a volume of 38 cm³.
Work out the density of the piece of gold.
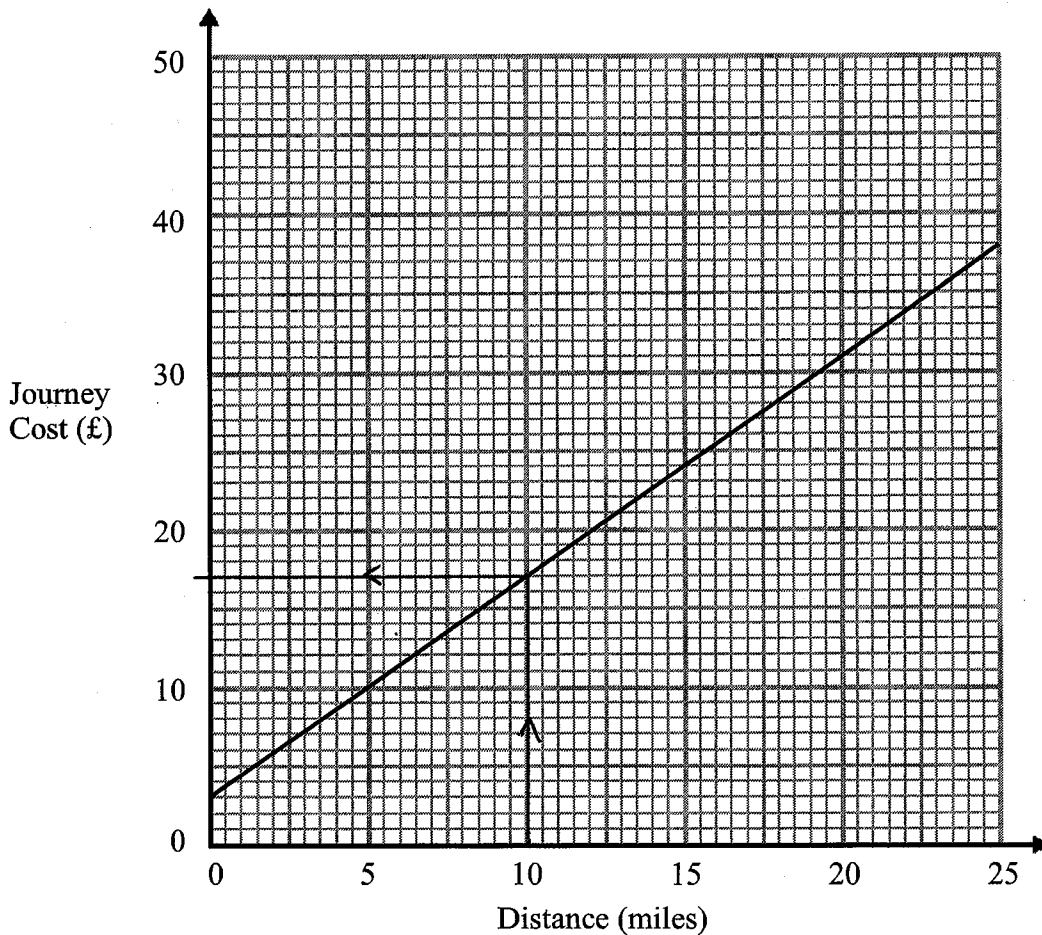
$$\text{density} = \frac{mass}{volume}$$
$$= \frac{722}{38} = 19$$

_19_ g/cm³

(Total for Question 3 is 1 mark)

4 Bill is a taxi driver.

You can use this graph to find the cost of a taxi for different distances.

For each journey there is a fixed charge plus a charge for the distance.

(a) How much is the fixed charge?

£.........3.........

(1)

Bill makes two journeys.
The distance of one journey is 10 miles further than the other journey.

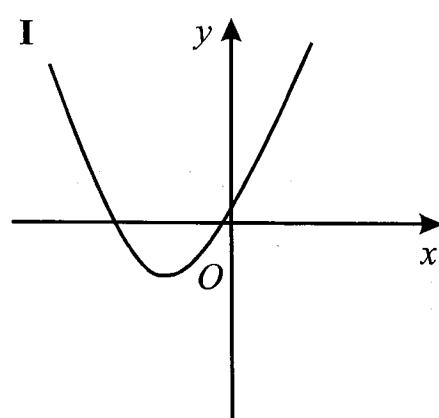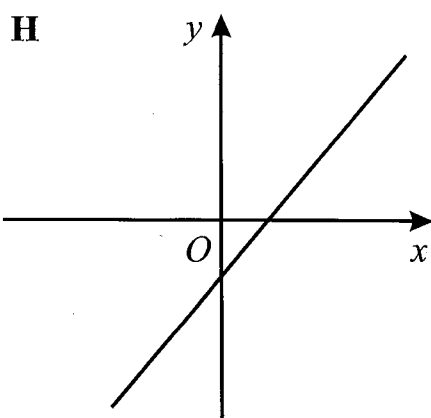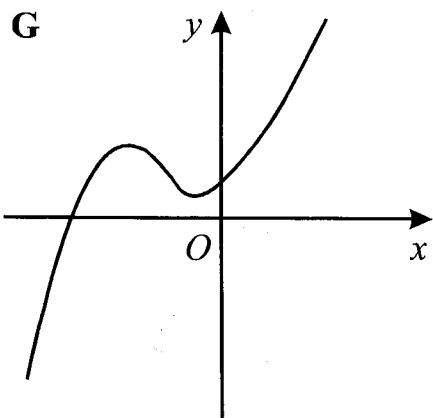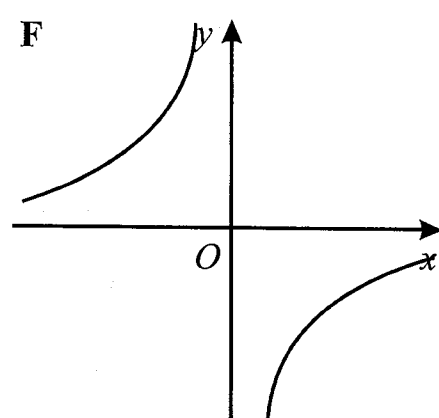(b) Work out the difference between the two journey costs.

10 mile journey £17

17 - 3

£.........14.........

(2)

(Total for Question 4 is 3 marks)

5 Here are nine graphs.

A

B

C

D

E

F

G

H

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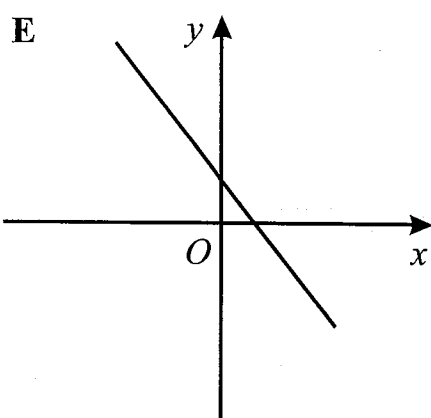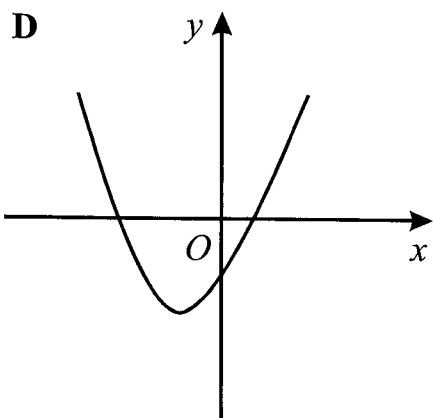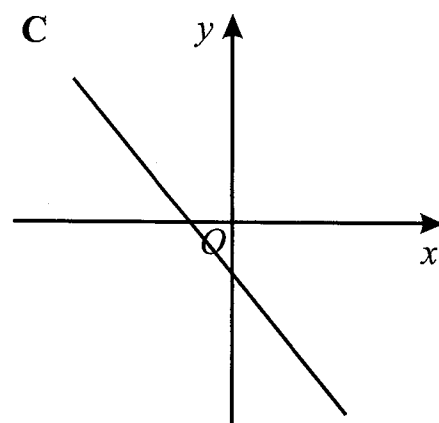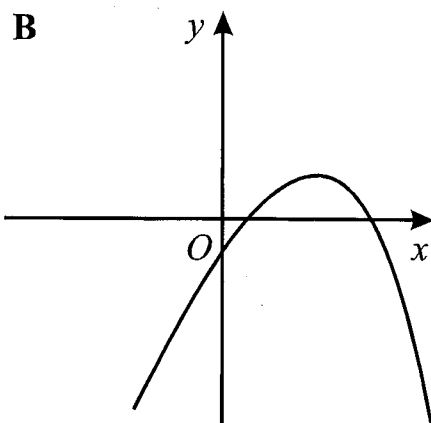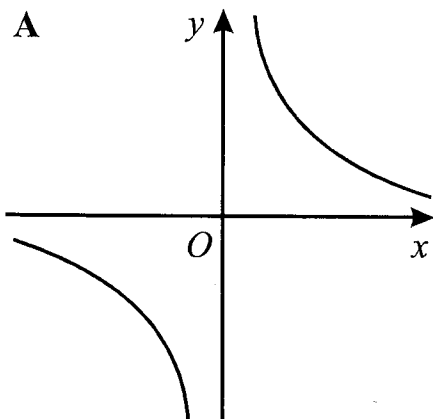
Write down the letter of the graph that could have the equation:

(i) $y = x^3 + 3x^2 + 3$

.... G

(1)

(ii) $y = x^2 + 4x + 1$

.... I

(1)

(iii) $y = -\dfrac{3}{x}$

.... F

(1)

(Total for Question 5 is 3 marks)

6 (a) Expand and simplify $(x-4)(x-9)$

$$x^2 - 9x - 4x + 36$$

$$x^2 - 13x + 36$$

(2)

(b) Factorise $x^2 - 64$

$$(x+8)(x-8)$$

(1)

(Total for Question 6 is 3 marks)

7 Solve $y^2 - y - 20 = 0$

$$(y+4)(y-5) = 0$$
$$y = -4 \qquad y = 5$$

$$y = -4 \text{ or } y = 5$$

(Total for Question 7 is 3 marks)

8 Dani leaves her house at 08 00.
She drives 28 miles to work.
She drives at an average speed of 35 miles per hour.
At what time does Dani arrive at work?

$$speed = \frac{distance}{time}$$

28 miles

35 mph

$$time = \frac{distance}{speed}$$

$$= \frac{28}{35} = 0.8 = 48 \text{ mins}$$

$$0848$$

(Total for Question 8 is 2 marks)

9 Complete the table of values for $y = x^2 - x - 3$

x	-2	-1	0	1	2	3	4
y	3	-1	-3	-3	-1	3	9
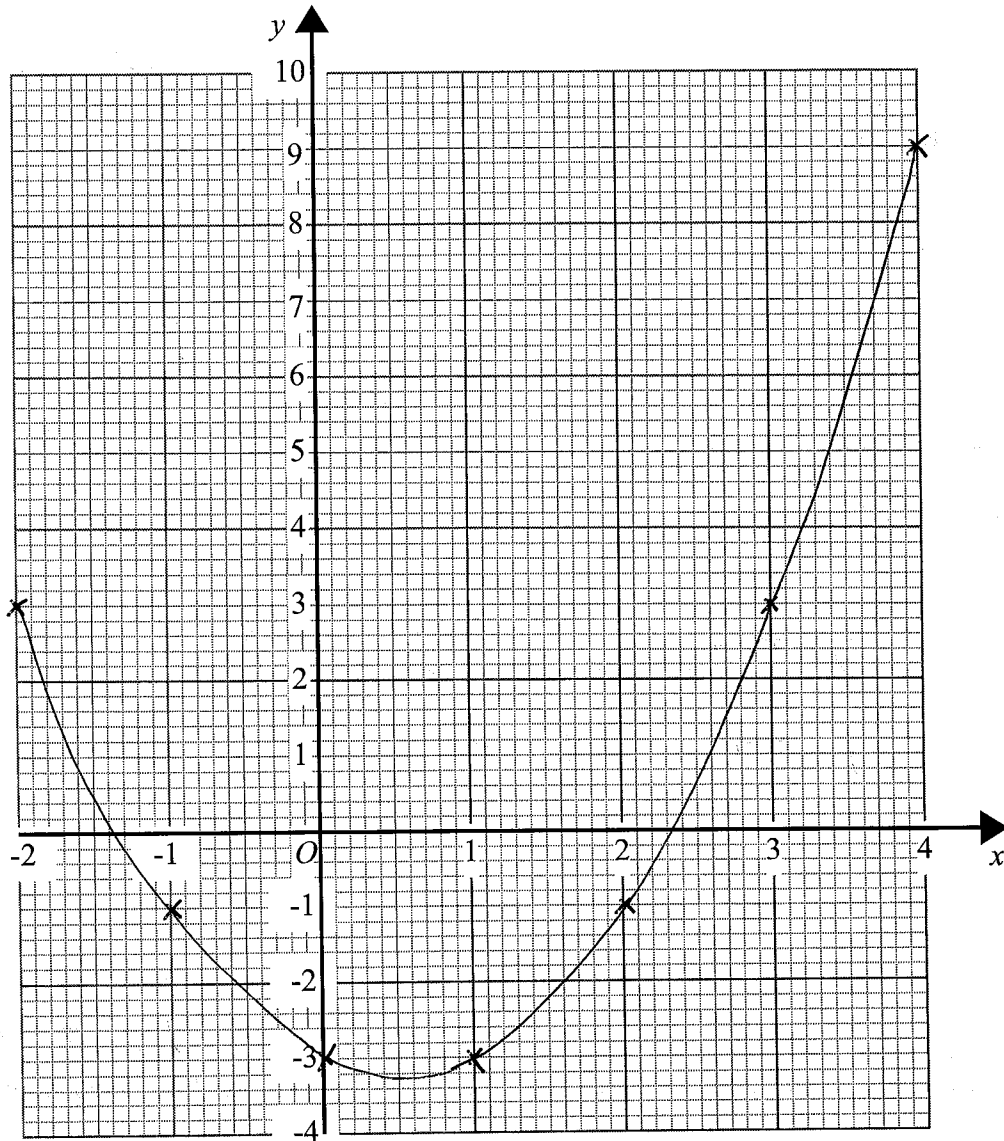
On the grid draw the graph of $y = x^2 - x - 3$ for values of x from −2 to 4

(Total for Question 9 is 4 marks)