

Name: _____

Maths Genie Stage 8

Test A

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.**

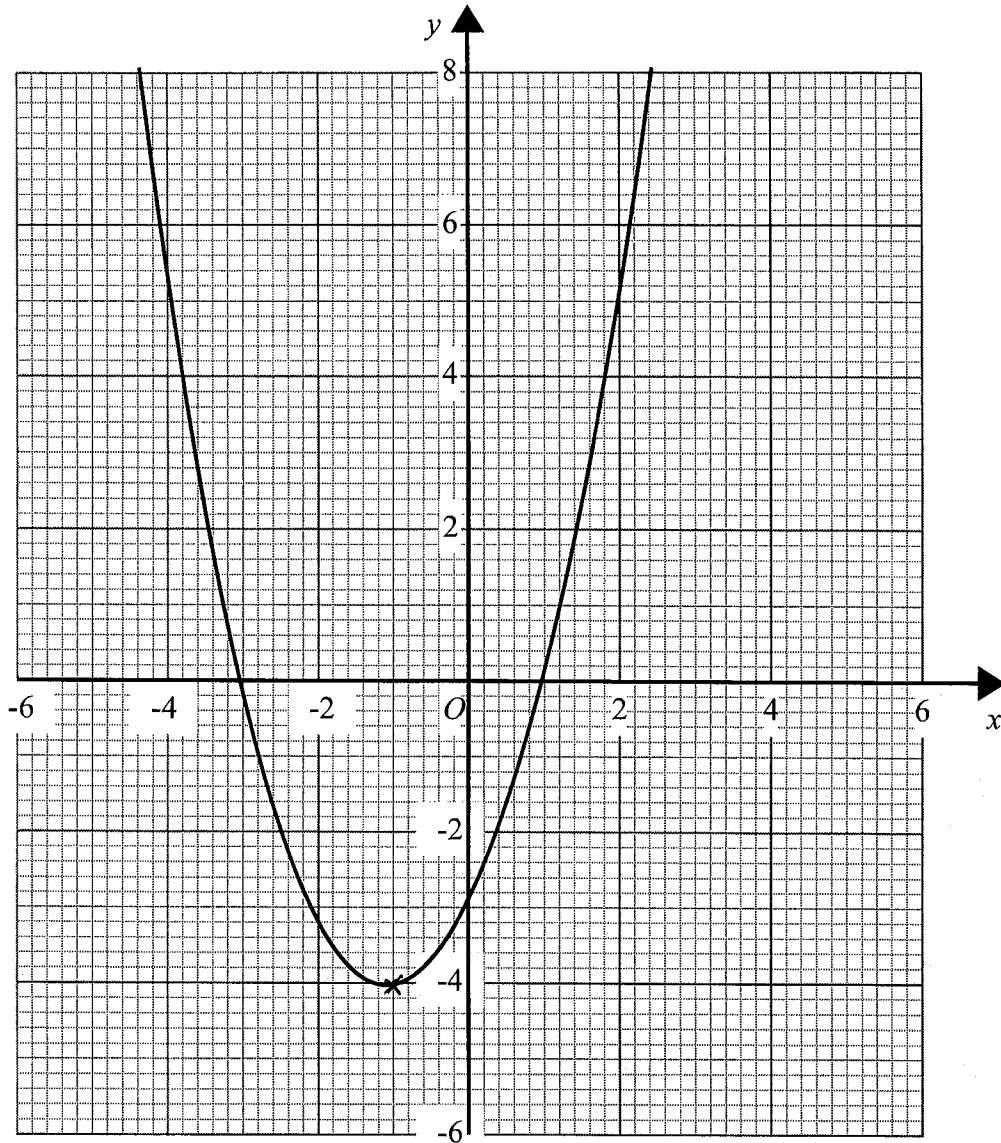
Information

- 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 Here is the graph of $y = x^2 + 2x - 3$



(a) Write down the turning point of the graph $y = x^2 + 2x - 3$

(..... -1 , -4)
(1)

(b) Use the graph to find the roots of the equation $x^2 + 2x - 3 = 0$

$x = 1$ and $x = -3$
.....
(2)

(Total for Question 1 is 3 marks)

2 (a) Write 8.9×10^{-2} as an ordinary number.

0.089

(1)

(b) Work out the value of $(4.6 \times 10^5) \times (7.5 \times 10^3)$
Give your answer in standard form.

3450000000

3.45×10^9

(2)

(Total for Question 2 is 3 marks)

3 In a sale, the normal price of a TV is reduced by 15%.
The sale price of the TV is £595

Work out the normal price of the TV.

$$x \times 0.85 = 595$$

$$x = \frac{595}{0.85}$$

$$= 700$$

£ 700

(Total for Question 3 is 2 marks)

4 (a) Expand and simplify $(5p-4)(p-2)$

$$5p^2 - 10p - 4p + 8$$

$$5p^2 - 14p + 8$$

(2)

(b) Factorise $a^2 + 6a - 55$

$$(a+11)(a-5)$$

(2)

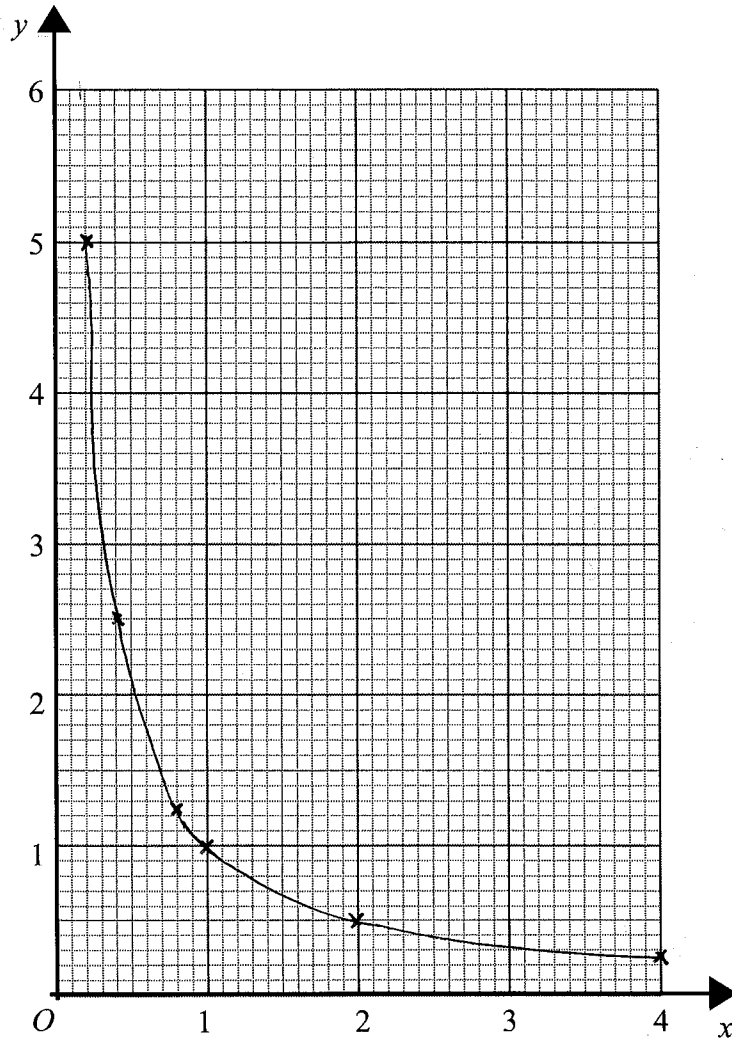
(Total for Question 4 is 4 marks)

5 (a) Complete the table of values for $y = \frac{1}{x}$

x	0.2	0.4	0.8	1	2	4
y	5	2.5	1.25	1	0.5	0.25

(2)

(b) On the grid, draw the graph of $y = \frac{1}{x}$

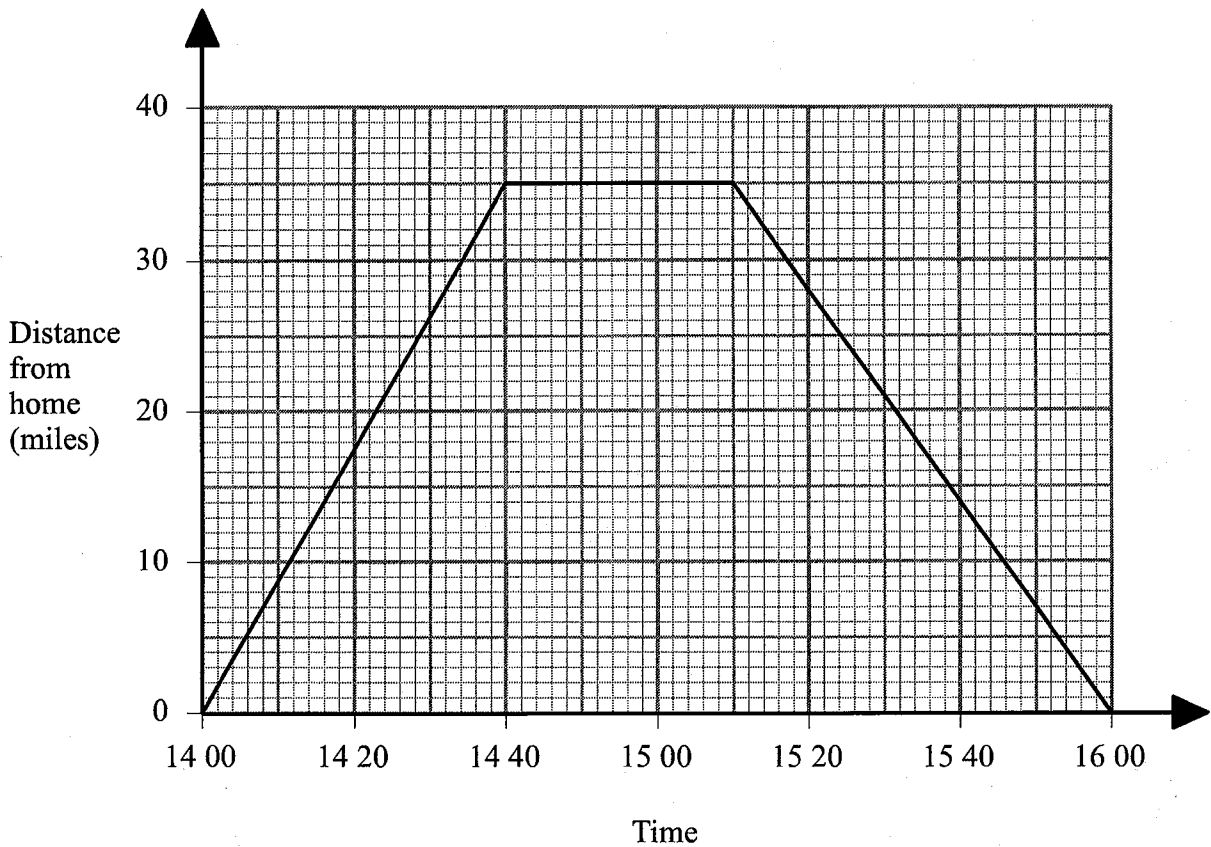


(2)

(Total for Question 5 is 4 marks)

6 Emily drove to the beach. She stayed at the beach and then she drove back home.

Here is Emily's travel graph.



(a) For how many minutes did Emily stay at the beach?

1440 to 1510

.....30.....minutes
(1)

(b) What was Emily's average speed on her journey to the beach?

35 miles in 40 mins

$$\text{Speed} = \frac{\text{distance}}{\text{time}} = \frac{35}{2/3}$$

.....52.5.....miles/hour
(2)

(Total for Question 6 is 3 marks)

7 Solve $b^2 - 8b + 12 = 0$

$$(b - 2)(b - 6) = 0$$

$$b = 2 \quad b = 6$$

$$b = 2 \text{ or } b = 6$$

(Total for Question 7 is 3 marks)

8 Liquid A has a density of 1.1 g/ml

150 ml of Liquid A is mixed with some of Liquid B to make Liquid C.

Liquid C has a mass of 378 g and a density of 1.05 g/ml

Find the density of Liquid B.

Give your answer correct to 3 significant figures.

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

$$\underline{\underline{A}} \quad \begin{aligned} d &= 1.1 \\ V &= 150 \end{aligned}$$

$$\underline{\underline{C}} \quad \begin{aligned} m &= 378 \\ d &= 1.05 \end{aligned}$$

$$\begin{aligned} \text{mass} &= d \times V \\ &= 1.1 \times 150 \\ &= 165 \text{ g} \end{aligned}$$

$$\begin{aligned} \text{volume} &= \frac{m}{d} \\ &= \frac{378}{1.05} \\ &= 360 \text{ ml} \end{aligned}$$

$$\underline{\underline{B}} \quad \begin{aligned} \text{mass} &= 378 - 165 \\ &= 213 \text{ g} \end{aligned}$$

$$\begin{aligned} \text{volume} &= 360 - 150 \\ &= 210 \text{ ml} \end{aligned}$$

$$\text{density} = \frac{213}{210} = 1.01$$

1.01

..... g/ml

(Total for Question 8 is 3 marks)