

Name: _____

Maths Genie Stage 8

Test C

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

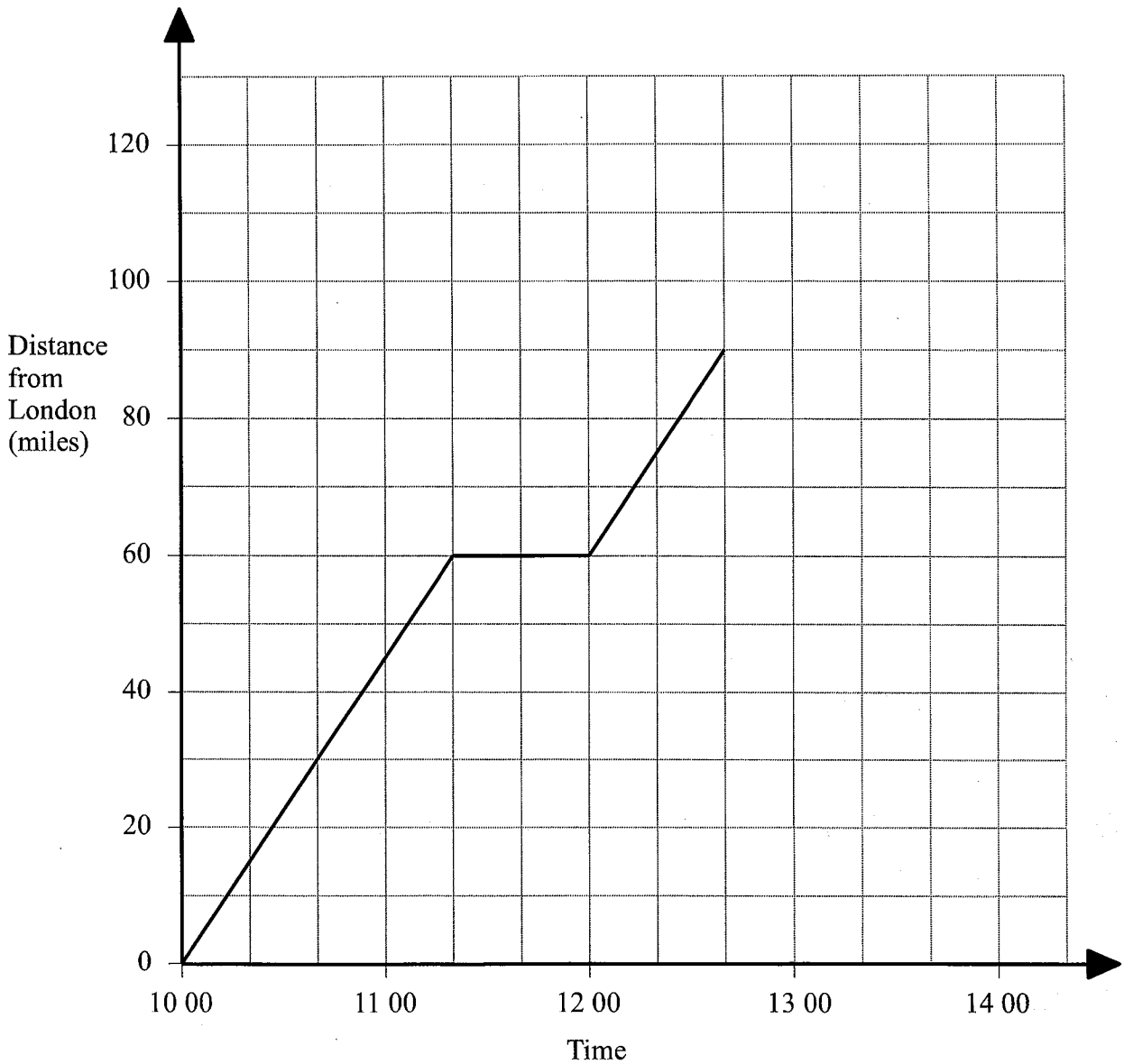
- The marks for each question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

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 Dawn drove from London to Birmingham. She made one stop at a service station.

Here is part of Dawn's travel graph.



(a) For how many minutes did Dawn stop at the service station?

.....40.....minutes
(1)

(b) What was Dawn's average speed between London and the service station?

60 miles in 1 hour 20 mins
$$\text{Speed} = \frac{\text{distance}}{\text{time}} = \frac{60}{4/3} = 45$$
.....45.....miles/hour
(2)

(Total for Question 1 is 3 marks)

- 2 In a sale, the normal price of a car is reduced by 30%.
The sale price of the car is £5950

Work out the normal price of the car.

$$\begin{aligned}x \times 0.7 &= 5950 \\x &= \frac{5950}{0.7} \\&= 8500\end{aligned}$$

£ 8500

(Total for Question 2 is 2 marks)

- 3 (a) Write 3.71×10^{-5} as an ordinary number.

0.0000371
(1)

- (b) Write 9 million in standard form.

9×10^6
(1)

- (c) Calculate $(4.3 \times 10^5) \times (3.5 \times 10^{-2})$
Give your answer in standard form.

15050

1.505×10^4
(2)

(Total for Question 3 is 4 marks)

- 4 Expand and simplify $(4x - 3)(x - 2)$

$$4x^2 - 8x - 3x + 6$$

$4x^2 - 11x + 6$

(Total for Question 4 is 2 marks)

5 Andrew ran 3.1 miles in 17 minutes and 25 seconds.

He assumes he can run 8 miles at the same speed.

Work out how long it would take Andrew to run 8 miles.

Give your answer in minutes and seconds to the nearest second.

$$17 \text{ mins } 25 \text{ seconds} = \frac{209}{12} \text{ mins} \quad \text{or} \quad 17 \frac{5}{12} \text{ mins}$$

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

$$= \frac{3.1}{209/12} = 0.178 \text{ miles/min}$$

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

$$= \frac{8}{0.178} = 44.9 \text{ mins} = 44 \text{ mins } 57 \text{ secs}$$

..... 44 mins 57 secs

(Total for Question 5 is 4 marks)

6 Solve $b^2 - 10b + 24 = 0$

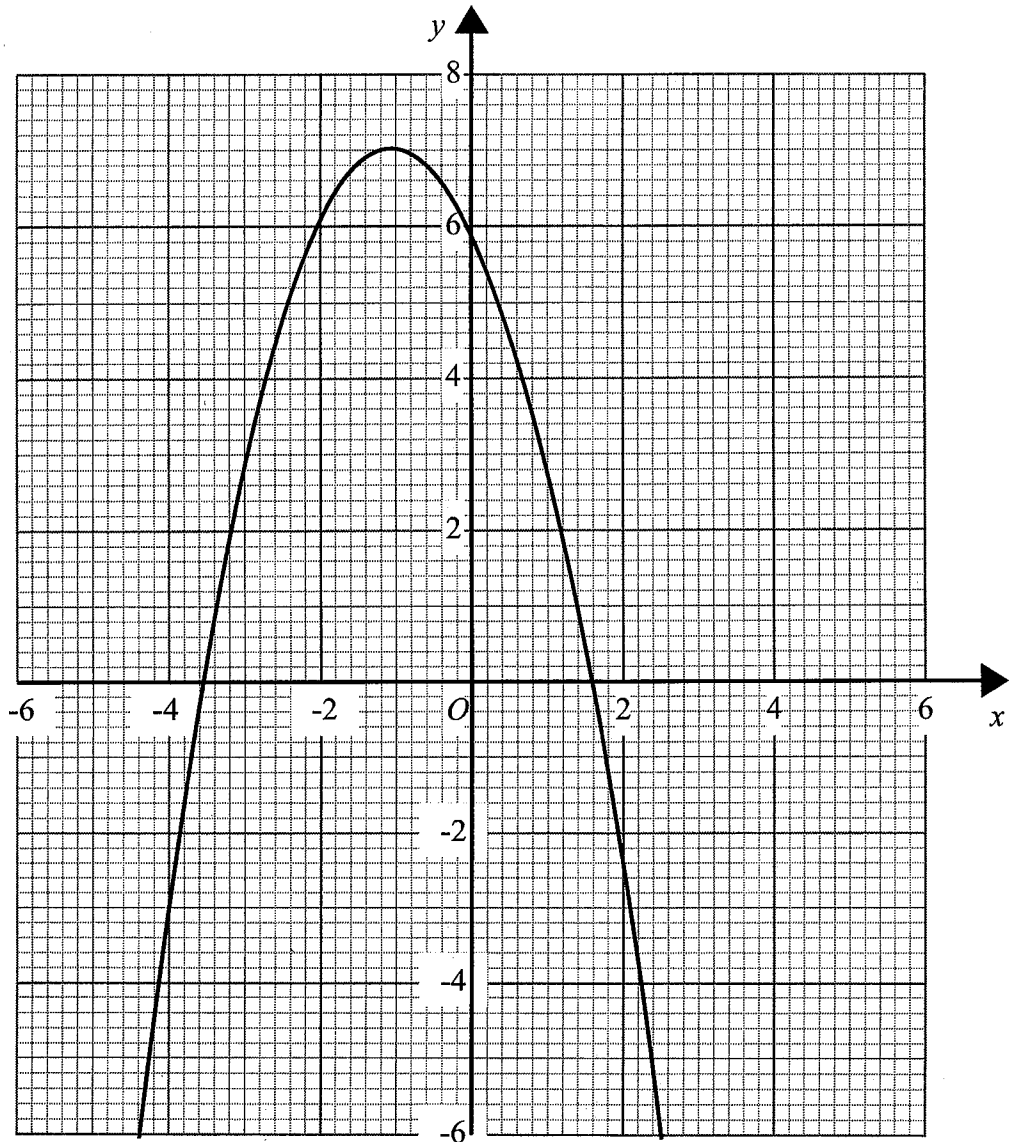
$$(b - 4)(b - 6) = 0$$

$$b = 4 \quad b = 6$$

$$b = 4 \text{ or } b = 6$$

(Total for Question 6 is 3 marks)

7

Here is the graph of $y = 6 - 2x - x^2$ (a) Write down the turning point of the graph $y = 6 - 2x - x^2$

(.....-1.....,7.....)
(1)

(b) Use the graph to find the roots of the equation $x^2 + 2x = 6$

.....1.6 and -3.6.....
(2)

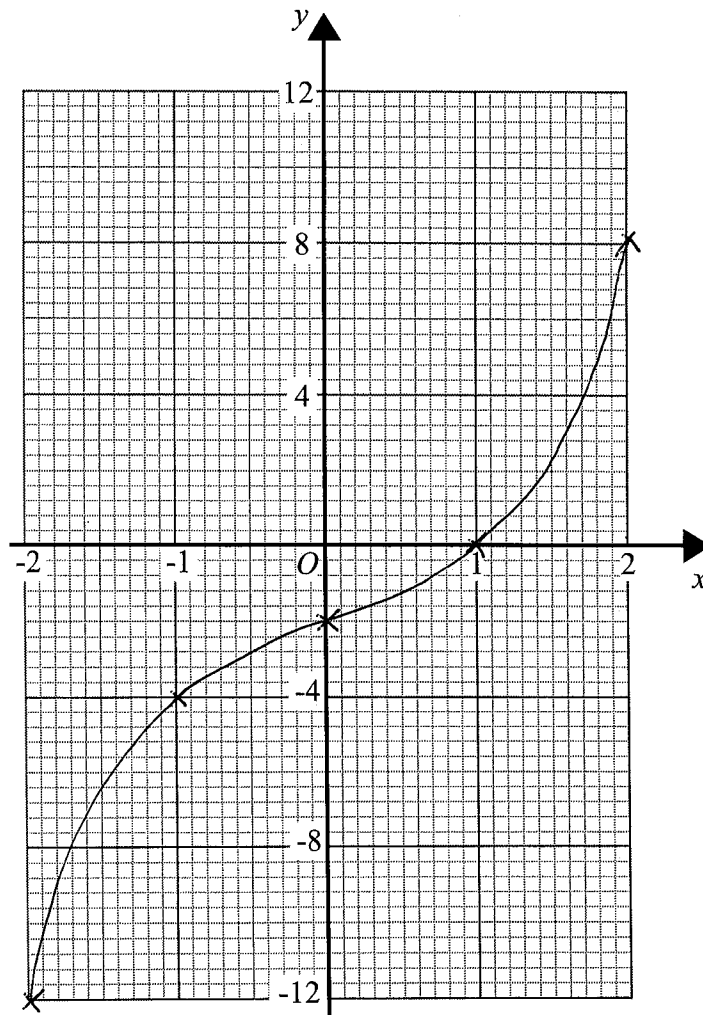
(Total for Question 7 is 3 marks)

8 (a) Complete the table of values for $y = x^3 + x - 2$

| | | | | | |
|-----|-----|----|----|---|---|
| x | -2 | -1 | 0 | 1 | 2 |
| y | -12 | -4 | -2 | 0 | 8 |

(2)

(b) On the grid, draw the graph of $y = x^3 + x - 2$



(2)

(Total for Question 8 is 4 marks)