

**AQA, OCR, Edexcel**

**GCSE**

# **GCSE Maths**

## **Completing the Square Hard Answers**

Name:

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**Total Marks:     /26**

## Completing the Square (Hard)

1. Write  $2x^2 + 7x - 3$  in the form  $a(x + m)^2 + n$ .

$$\left(x + \frac{7}{4}\right)^2 - \frac{73}{8}$$

(4 Marks)

2. a. Write  $2x^2 + 9x + 1$  in the form  $a(x + m)^2 + n$ .

$$2\left(x + \frac{9}{4}\right)^2 - \frac{73}{8}$$

- b. Hence solve  $2x^2 + 9x + 1 = 0$ , leaving your answer in surd form.

$$x = -\frac{9}{4} - \frac{\sqrt{73}}{4}, \quad x = \frac{\sqrt{73}}{4} - \frac{9}{4}$$

(5 Marks)

3. A curve has an equation  $y = 2x^2 - 5x + 12$ .

- a. Write  $y = 2x^2 - 5x + 12$  in the form  $y = a(x + m)^2 + n$ .

$$y = 2\left(x - \frac{5}{4}\right)^2 + \frac{71}{8}$$

- b. Find the coordinates of the minimum point of the graph.

$$\left(\frac{5}{4}, \frac{71}{8}\right)$$

- c. Does the graph of  $y = 2x^2 - 5x + 12$  cross the x-axis? If yes, then find the coordinates of the point of intersection.

No

(6 Marks)

4. A curve has an equation  $y = 2x^2 - 11x - 15$

d. Write  $y = 2x^2 - 11x - 15$  in the form  $y = a(x + m)^2 + n$ .

$$2\left(x - \frac{11}{4}\right)^2 - \frac{241}{8}$$

e. Find the coordinates of the minimum point of the graph.

$$\left(\frac{11}{4}, -\frac{241}{8}\right)$$

f. Does the graph of  $y = 2x^2 - 11x - 15$  cross the x-axis? If yes, then find the coordinates of the point of intersection.

$$\text{Yes, } x = \frac{11}{4} - \frac{\sqrt{241}}{4}, x = \frac{11}{4} + \frac{\sqrt{241}}{4}$$

(6 Marks)

5. A curve has an equation  $y = -x^2 - 5x - 10$ .

Find the coordinates for the maximum point of the graph.

$$\left(-\frac{5}{2}, -\frac{15}{4}\right)$$

(5 Marks)