AQA, OCR, Edexcel

GCSE

GCSE Maths

Completing the Square Hard Answers

Name:

M M E

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Total Marks: /26

Completing the Square (Hard)

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

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

(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.

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

(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)