

# Completing the Square

## Question Paper 2

|            |                       |
|------------|-----------------------|
| Level      | A Level               |
| Subject    | Maths                 |
| Exam Board | OCR                   |
| Topic      | Polynomials           |
| Sub Topic  | Completing the Square |
| Booklet    | Question Paper 2      |

**Time Allowed:** 59 minutes

**Score:** /49

**Percentage:** /100

- 1**
- (i) Express  $2x^2 - 6x + 11$  in the form  $p(x + q)^2 + r$ . [4]
  - (ii) State the coordinates of the vertex of the curve  $y = 2x^2 - 6x + 11$ . [2]
  - (iii) Calculate the discriminant of  $2x^2 - 6x + 11$ . [2]
  - (iv) State the number of real roots of the equation  $2x^2 - 6x + 11 = 0$ . [1]
  - (v) Find the coordinates of the points of intersection of the curve  $y = 2x^2 - 6x + 11$  and the line  $7x + y = 14$ . [5]
- 2**
- (i) Express  $x^2 + 8x + 15$  in the form  $(x + a)^2 - b$ . [3]
  - (ii) Hence state the coordinates of the vertex of the curve  $y = x^2 + 8x + 15$ . [2]
  - (iii) Solve the inequality  $x^2 + 8x + 15 > 0$ . [4]
- 3**
- (i) Express  $2x^2 + 12x + 13$  in the form  $a(x + b)^2 + c$ . [4]
  - (ii) Solve  $2x^2 + 12x + 13 = 0$ , giving your answers in simplified surd form. [3]
- 4**
- (i) Express  $3x^2 + 12x + 7$  in the form  $3(x + a)^2 + b$ . [4]
  - (ii) Hence write down the equation of the line of symmetry of the curve  $y = 3x^2 + 12x + 7$ . [1]
- 5** Solve the inequalities
- (i)  $-9 \leq 6x + 5 \leq 0$ , [3]
  - (ii)  $6x + 5 < x^2 + 2x - 7$ . [5]
- 6**
- (i) Evaluate  $9^0$ . [1]
  - (ii) Express  $9^{-\frac{1}{2}}$  as a fraction. [2]