Completing the Square Exam Questions (From OCR 4721)

Q1 (Jun 2005, Q2)

(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]

Q2 (Jun 2006, Q3)

(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]

Q3 (Jan 2007, Q6)

(i) Express $2x^2 - 24x + 80$ in the form $a(x - b)^2 + c$. [4]

(ii) State the equation of the line of symmetry of the curve $y = 2x^2 - 24x + 80$. [1]

(iii) State the equation of the tangent to the curve $y = 2x^2 - 24x + 80$ at its minimum point. [1]

Q4 (Jun 2008, Q10) [Modified]

(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]

Q5 (Jan 2009, Q6) [Modified]

(i) Express $5x^2 + 20x - 8$ in the form $p(x + q)^2 + r$. **[4]**

(ii) State the equation of the line of symmetry of the curve $y = 5x^2 + 20x - 8$. **[1]**

Q6 (Jun 2012, Q4)

(i) Express $2x^2 - 20x + 49$ in the form $p(x - q)^2 + r$. **[4]**

(ii) State the coordinates of the vertex of the curve $y = 2x^2 - 20x + 49$. **[2]**
