

O Level Additional Maths (4037)

Completing Square Method

Q1. W25/P12/Q4

Show that $2x^2 + 5x + 3$ can be written in the form $2(x+a)^2 + b$, where a and b are constants to be found. [2]

Q2. W25/P23/Q3

(a) (i) Write $x^2 - x - 6$ in the form $(x+a)^2 + b$ where a and b are constants. [2]

Q3. S24/P21/Q2

(a) Write $3 + 4x - 2x^2$ in the form $a + b(x+c)^2$, where a, b and c are integers. [3]

Q4. W24/P23/Q2

The function f is defined by $f(x) = 1 - 4x - x^2$ for all real values of x .

(a) Write $f(x)$ in the form $a - (x+b)^2$, where a and b are constants. [2]

Q5. S23/P11/Q1

(a) Write $5x^2 - 14x + 8$ in the form $a(x+b)^2 + c$, where a, b and c are constants to be found. [3]

Q6. S23/P22/Q1

(b) (i) Write $3x^2 - 12x + 16$ in the form $a(x+b)^2 + c$ where a, b and c are integers. [3]

O-A LEVELS
MATHEMATICS
SIR AYAZ RAO

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(Marking Scheme)

Q1. W25/P12/Q4

4(a)	$2\left(x + \frac{5}{4}\right)^2 - \frac{1}{8}$	2	B1 for $2\left(x + \frac{5}{4}\right)^2$ B1 for $-\frac{1}{8}$
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Q2. W25/P23/Q3

3(a)(i)	$\left(x - \frac{1}{2}\right)^2 - \frac{25}{4}$ oe isw	B2	B1 for $\left(x - \frac{1}{2}\right)^2$ or for $(x + a)^2 - \frac{25}{4}$ OR B1 for $a = -\frac{1}{2}, b = -\frac{25}{4}$ stated
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Q3. S24/P21/Q2

2(a)	$5 - 2(x - 1)^2$	B3	Mark final expression B2 for $-2(x - 1)^2$ or B1 for $(x - 1)^2$ or $b = -2, c = -1$ and B1 for $5 + b(x + c)^2$ oe with numerical values of b and c or $a = 5$
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Q4. W24/P23/Q2

2(a)	$5 - (x + 2)^2$	B2	B1 for $-(x + 2)^2$ or $(x + 2)^2$ or $a = 5$ and $b = 2$
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Q5. S23/P11/Q1

1(a)	$5\left(x - \frac{7}{5}\right)^2 - \frac{9}{5}$	3	B1 for $5(x \pm b)^2$ B1 for $\left(x - \frac{7}{5}\right)^2$ B1 for $-\frac{9}{5}$
Alternative By comparing coefficients: $a(x^2 + 2bx + b^2) + c = 5x^2 - 14x + 8$. $2abx = -14x$ $ab^2 + c = 8$		(3)	B1 for $a = 5$ B1 for $b = \frac{-14}{10}$ oe B1 for $c = \frac{-18}{10}$ oe

Q6. S23/P22/Q1

1(b)(i)	$3(x - 2)^2 + 4$	3	B2 for $3(x - 2)^2$ or B1 for $(x - 2)^2$ or $a = 3, b = -2$ and B1 for $a(x + b)^2 + 4$ with numerical values of a and b or $c = 4$
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