

Completing the Square

For AQA GCSE Mathematics (8300) • Higher tier

Name _____

Total marks: **22**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

1 (a) Write $x^2 + 10x$ in the form $(x + a)^2 - b$

[1 mark]

Answer _____

(b) Write $x^2 - 14x + 9$ in the form $(x - a)^2 - b$

[1 mark]

Answer _____

2 Write each expression in the form $(x + a)^2 + b$

(a) $x^2 + 6x + 2$

[2 marks]

Answer _____

(b) $x^2 - 10x + 30$

[2 marks]

Answer _____

(c) $x^2 + 5x + 1$

[2 marks]

Answer _____

3 Solve $x^2 - 6x + 2 = 0$ by completing the square.
Give your answers in the form $a \pm \sqrt{b}$

[3 marks]

Answer _____

- 4 (a) Write $x^2 - 4x + 7$ in the form $(x - a)^2 + b$

[2 marks]

Answer _____

- (b) Hence explain why $x^2 - 4x + 7 > 0$ for all values of x .

[1 mark]

- 5 $x^2 + px + q \equiv (x - 3)^2 + 2$
Work out the values of p and q .

[2 marks]

Answer $p =$ _____ $q =$ _____

- 6 Kai says,
“When x is between 5 and 7, the value of $x^2 - 12x + 39$ is negative.”
By completing the square, show that Kai is wrong.

[3 marks]

- 7 The n th term of a sequence is $n^2 - 24n + 155$
By completing the square, show that all the terms of the sequence have two or more digits.

[3 marks]
