

# Completing the Square - Harder

For AQA GCSE Mathematics (8300) • Higher tier

Name \_\_\_\_\_

Total marks: **26**

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

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

(a)  $2x^2 + 12x + 5$

**[3 marks]**

Answer \_\_\_\_\_

(b)  $3x^2 - 6x + 1$

**[3 marks]**

Answer \_\_\_\_\_

(c)  $2x^2 - 8x + 3$

**[3 marks]**

Answer \_\_\_\_\_

- 2** (a) Write  $5 + 4x - x^2$  in the form  $p - (x + q)^2$

**[2 marks]**

Answer \_\_\_\_\_

- (b) Hence write down the maximum value of  $5 + 4x - x^2$  and the value of  $x$  where it occurs.

**[2 marks]**

Answer \_\_\_\_\_

- 3** By completing the square, solve  $2x^2 + 4x - 3 = 0$   
Give your answers to 2 decimal places.

**[4 marks]**

Answer \_\_\_\_\_

- 4** Write  $3x^2 - 18x + 11$  in the form  $d(x + e)^2 + f$  where  $d$ ,  $e$  and  $f$  are integers.

**[3 marks]**

Answer \_\_\_\_\_

**5** This question is about the expression  $2x^2 + 6x + 7$

(a) Write  $2x^2 + 6x + 7$  in the form  $a(x + b)^2 + c$

**[3 marks]**

Answer \_\_\_\_\_

(b) Hence, solve  $2x^2 + 6x + 7 = 15$

**[2 marks]**

Answer \_\_\_\_\_

(c) Explain why the equation  $2x^2 + 6x + 7 = 2$  has no solutions.

**[1 mark]**

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