Name: _____

GCSE (1 – 9)

Completing the Square

Instructions

• Use **black** ink or ball-point pen.
• Answer all questions.
• Answer the questions in the spaces provided
– *there may be more space than you need.*
• Diagrams are **NOT** accurately drawn, unless otherwise indicated.
• You must **show all your working out.**

Information

• The marks for each question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

• Read each question carefully before you start to answer it.
• Keep an eye on the time.
• Try to answer every question.
• Check your answers if you have time at the end

1 (a) Write $x^2 - 6x + 1$ in the form $(x + a)^2 + b$ where a and b are integers.

…..........................…..........................

(2)

(b) Hence, or otherwise, write down the coordinates of the turning point of the graph of $y = x^2 - 6x + 1$

…..........................

(1)

(Total for question 1 is 3 marks)

2 (a) Write $x^2 + 8x + 5$ in the form $(x + a)^2 + b$ where a and b are integers.

…..........…..

(2)

(b) Hence, or otherwise, write down the coordinates of the turning point of the graph of $y = x^2 + 8x + 5$

…..........................

(1)

(Total for question 2 is 3 marks)

3   (a) Write $x^2 + 10x + 2$ in the form $(x + a)^2 + b$ where a and b are integers.

….....…..
(2)

(b) Hence, or otherwise, write down the coordinates of the turning point of the graph of $y = x^2 + 10x + 2$

….........................
(1)

(Total for question 3 is 3 marks)

4   (a) Write $x^2 - 2x - 1$ in the form $(x + a)^2 + b$ where a and b are integers.

….........…...
(2)

(b) Hence, or otherwise, write down the coordinates of the turning point of the graph of $y = x^2 - 2x - 1$

….........................
(1)

(Total for question 4 is 3 marks)

5 By completing the square, find the coordinates of the turning point of the curve with the
equation $y = x^2 + 8x + 3$
You must show all your working.

…..........................

(Total for question 5 is 3 marks)

6 By completing the square, find the coordinates of the turning point of the curve with the
equation $y = x^2 + 10x - 8$
You must show all your working.

…..........................

(Total for question 6 is 3 marks)

7 By completing the square, find the coordinates of the turning point of the curve with the equation $y = x^2 + 3x - 7$

You must show all your working.

…..........................

(Total for question 7 is 3 marks)

8 By completing the square, find the coordinates of the turning point of the curve with the equation $y = x^2 - x + 8$

You must show all your working.

…..........................

(Total for question 8 is 3 marks)

9 (a) Write $2x^2 - 12x + 23$ in the form $a(x + b)^2 + c$ where a, b, and c are integers.

…...

(3)

(b) Hence, or otherwise, write down the coordinates of the turning point of the graph of $y = 2x^2 - 12x + 23$

…...........................

(1)

(Total for question 9 is 4 marks)

10 (a) Write $2x^2 + 16x + 26$ in the form $a(x + b)^2 + c$ where a, b, and c are integers.

…..

(3)

(b) Hence, or otherwise, write down the coordinates of the turning point of the graph of $y = 2x^2 + 16x + 26$

…...........................

(1)

(Total for question 10 is 4 marks)

11 (a) Write $3x^2 - 6x + 6$ in the form $a(x + b)^2 + c$ where a, b, and c are integers.

…...........…..

(3)

(b) Hence, or otherwise, write down the coordinates of the turning point of the graph of $y = 3x^2 - 6x + 6$

…..........................

(1)

(Total for question 11 is 4 marks)

12 (a) Write $3x^2 - 30x + 63$ in the form $a(x + b)^2 + c$ where a, b, and c are integers.

…...........…..

(3)

(b) Hence, or otherwise, write down the coordinates of the turning point of the graph of $y = 3x^2 - 30x + 63$

…..........................

(1)

(Total for question 12 is 4 marks)

13 By completing the square, solve $x^2 + 10x - 3 = 0$
Give your answers in surd form.

....
(Total for question 13 is 5 marks)

14 By completing the square solve $x^2 + 5x + 4.25 = 0$
Give your answers in surd form.

....
(Total for question 14 is 5 marks)