

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)  
(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)  
(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)  
(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)  
(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.

(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.

(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.

(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.

(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)  
(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)
- (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)
- (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)
- (4 marks)
- 13 By completing the square, solve  $x^2 + 10x - 3 = 0$  Give your answers in surd form. (5 marks)
- 14 By completing the square, solve  $x^2 + 5x + 4.25 = 0$  Give your answers in surd form. (5 marks)