QT Completing the Square

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

(2 marks)

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

2. (a) Write $x^2 + 10x + 8$ in the form $(x + a)^2 + b$ where a and b are integers

(2 marks)

   (b) Hence, or otherwise, write down the coordinates of the turning point of the graph
   $$y = x^2 + 10x + 8$$
   (1 mark)

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3. (a) Write $x^2 + 3x - 7$ in the form $(x + a)^2 + b$ where a and b are integers

(2 marks)

   (b) Hence, or otherwise, write down the coordinates of the turning point of the graph
   $y = x^2 + 3x - 7$

(1 mark)

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

(2 marks)

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

(1 mark)

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5. 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)

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

(3 marks)

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7. By completing the square, find the coordinates of the turning point of the curve with the equation $y = x^2 - 5x + 1$. 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 $y = x^2 + 0.5x + 7$. You must show all your working.
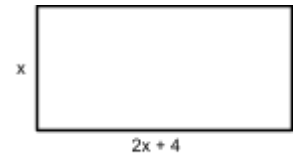
(3 marks)

QT Completing the Square

9. A rectangle has sides of $x\ cm$ and $(2x + 4)\ cm$ as shown.
The area of the rectangle is $30\ cm^2$.

    (a) Show that $(x + 1)^2 - 16 = 0$ (3 marks)

    (b) Hence, or otherwise, find the perimeter of the rectangle   (2 mark)

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10. (a) Write $2x^2 - 12x + 24$ in the form $a(x + b)^2 + c$ where a, b and c are integers

(3 marks)

(b) Hence, or otherwise, write down the coordinates of the turning point of the graph

$$y = 2x^2 - 12x + 24$$

(1 mark)

11. (a) Write $2x^2 + 8x + 10$ in the form $a(x + b)^2 + c$ where a, b and c are integers

(3 marks)

(b) Hence, or otherwise, write down the coordinates of the turning point of the graph

$$y = 2x^2 + 8x + 10$$

(1 mark)

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12.(a) Write $3x^2 + 6x - 8$ in the form $a(x + b)^2 + c$ where a, b and c are integers

(3 marks)

(b) Hence, or otherwise, write down the coordinates of the turning point of the graph

$$y = 3x^2 + 6x - 8$$

(1 mark)

13. (a) Write $4x^2 - 8x - 7$ in the form $a(x + b)^2 + c$ where a, b and c are integers

(3 marks)

(b) Hence, or otherwise, write down the coordinates of the turning point of the graph

$$y = 4x^2 - 8x - 7$$

(1 mark)

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14. By completing the square, solve $x^2 = 22x - 5$
    Give your answers in surd form.   (5 marks)

15. By completing the square, solve $x^2 + 5x + \frac{17}{4} = 0$
    Give your answers in surd form.   (5 marks)