

COMPLETING THE SQUARE

Answer all of these questions. Remember to show your working out in all questions.

MAIN QUESTIONS

1.

$$x^2 + 6x + 5$$

3.

$$x^2 + 10x - 11$$

5.

$$2x^2 + 12x + 10$$

7.

$$4x^2 + 16x - 20$$

9.

$$x^2 + 7x + 10$$

2.

$$x^2 - 8x + 12$$

4.

$$x^2 - 4x - 21$$

6.

$$3x^2 - 18x + 15$$

8.

$$5x^2 - 30x + 25$$

10.

$$2x^2 - 5x + 3$$

MASTER QUESTIONS



M1.

A ball is thrown upwards from a height of 2 metres with initial velocity 20 m/s.

The height h after t seconds is given by $h = -5t^2 + 20t + 2$. Find the maximum height reached by completing the square.

A rectangular garden has an area of 60m^2 . If the length is 4 metres more than the width, find the dimensions by forming and solving a quadratic equation using completing the square.

The profit P in pounds from selling x items is given by $P = -2x^2 + 80x - 600$.

Find the number of items that must be sold to maximise profit by completing the square.

A stone is dropped from a cliff. Its height h in metres after t seconds is $h = -5t^2 + 100$. Find when the stone hits the ground by completing the square.

M5.

The sum of two numbers is 16 and the sum of their squares is 146. Find the numbers by forming a quadratic equation and solving using completing the square.