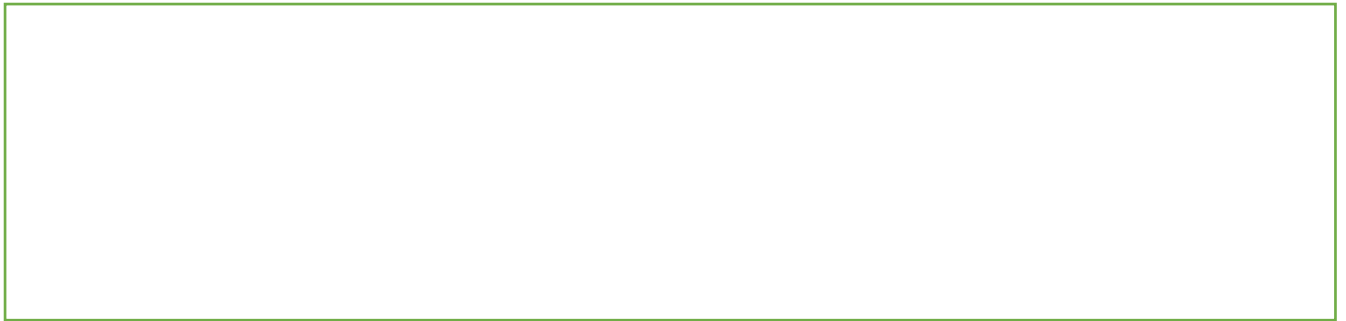


Solving by Completing the Square



Worked Examples (a = 1):

1. $x^2 + 12x$

2. $x^2 + 8x$

3. $x^2 - 2x$

4. $x^2 - 6x + 7$

More complicated examples (a not equal to 1):

1. Express $2x^2 + 12x + 7$ in the form $a(x + b)^2 + c$

2. Express $5 - 3x^2 + 6x$ in the form $a - b(x + c)^2$

Test Your Understanding:

1. Express $3x^2 - 18x + 4$ in the form $a(x + b)^2 + c$

2. Express $20x - 5x^2 + 3$ in the form $a - b(x + c)^2$

Solving by Completing the Square:

Note: Previously we factorised out the 3. This is because $3x^2 - 18x + 4$ on its own is an **expression**, so dividing by 3 (instead of factorising) would change the expression. However, in an equation, we can divide both sides by 3 without affecting the solutions.

Example

Solve the equation $3x^2 - 18x + 4 = 0$ by completing the square.

Proving the Quadratic Formula: