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 $a\left(x+b\right)^{2}+c$

2. Express $5-3x^{2}+6x$ in the form $a-b\left(x+c\right)^{2}$

Test Your Understanding:

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

2. Express $20x-5x^{2}+3$ in the form $a-b\left(x+c\right)^{2}$

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:

Exercise 2C/ 2D Page 23/ 24