Factorising Quadratic Expressions

Condsider $(x + a)(x + b)$

$$= x^2 + ax + bx + ab$$

$$= x^2 + (a+b)x + ab$$

Factorising is the reverse of expanding brackets

Ex1

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

$$= (x + 2)(x + 3)$$

Factors of 6

+1	+6
−1	−6
+2	+3 ✓
−2	−3

Ex2

$$x^2 - 9x + 8$$

$$= (x - 1)(x - 8)$$

+1	+8
−1	−8 ✓
+2	+4
−2	−4

Ex3

$$x^2 - 3x - 10$$

$$= (x + 2)(x - 5)$$

+1	−10
−1	+10
+2	−5 ✓
−2	+5

Ex4

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

$$= (x - 1)(x + 11)$$

+1	−11
−1	+11 ✓

Factorise

1) $x^2 + 7x + 10 = (x+2)(x+5)$

2) $x^2 + 11x + 24 = (x+3)(x+8)$

3) $x^2 + 15x + 14 = (x+1)(x+14)$

4) $x^2 - 10x + 9 = (x-1)(x-9)$

5) $x^2 - 12x + 20 = (x-2)(x-10)$

6) $x^2 + 4x - 5 = (x-1)(x+5)$

7) $x^2 - 4x - 12 = (x+2)(x-6)$

8) $x^2 - 3x - 18 = (x+3)(x-6)$

9) $x^2 + 10x - 11 = (x-1)(x+11)$

10) $x^2 - 7x - 30 = (x+3)(x-10)$

Solving Quadratic Equations

Ex 1   Solve $x^2 + 7x + 10 = 0$

$(x+2)(x+5) = 0$

Either $x+2 = 0$ or $x+5 = 0$

$x = -2$ $x = -5$

Ex 2   Solve $x^2 - 4x - 12 = 0$

$(x + 2)(x - 6) = 0$

Either $x + 2 = 0$ or $x - 6 = 0$

$x = -2$ $x = 6$

Solve

1) $x^2 - 5x - 6 = 0$

$(x + 1)(x - 6) = 0$

Either $x + 1 = 0$ or $x - 6 = 0$

$x = -1$ $x = 6$

2) $x^2 - 8x + 15 = 0$

$(x - 3)(x - 5) = 0$

Either $x - 3 = 0$ or $x - 5 = 0$

$x = 3$ $x = 5$

3) $x^2 + 8x + 16 = 0$

$(x + 4)(x + 4) = 0$

Either $x + 4 = 0$ or $x + 4 = 0$

$x = -4$ $x = -4$

Factorising Quadratics With Multiple x^2

Ex

$2 \times 5 = 10$

$+1 \ +10$ ✓

$-1 \ -10$

$+2 \ +5$

$-2 \ -5$

$2x^2 + 11x + 5$

$2x^2 + x + 10x + 5$

$x(2x + 1) + 5(2x + 1)$

$$= (x+5)(2x+1)$$

$$= (x+5)(2x+1)$$