

Algebra Topics: Quadratics**Expanding Brackets****Example.** EXPAND AND SIMPLIFY $(2x + 3)(3x - 4)$

$$(2x + 3)(3x - 4) = 6x^2 - 8x + 9x - 12 = 6x^2 + x - 12$$

1. Expand and simplify $(3x - 1)(x + 2)$ [2]
2. Expand and simplify $(x + 7)(x - 3)$ [2]
3. Expand and simplify $(x + 5)(x - 6)$ [2]
4. Expand and simplify $(x - 3)(x - 4)$ [2]
5. Expand and simplify $(2x - 3)(x - 4)$ [2]

Factorising Quadratic Expressions**Example.** FACTORISE $x^2 - x - 12$

$$x^2 - x - 12 = (x + 3)(x - 4)$$

1. Factorise $x^2 - 6x + 8$ [2]
2. a. Factorise $x^2 - 16$ [1]
b. Simplify $\frac{x^2 - 16}{2x^2 + 5x - 12}$ [3]
3. Factorise $x^2 + 7x - 18$ [2]
4. Factorise $16x^2 - 1$ [2]
5. Factorise $x^2 + 2x - 8$ [2]
6. Factorise $x^2 + x - 20$ [2]
7. Factorise $x^2 - 4x - 12$ [2]

Solving Quadratic Equations by factorising

Example. FACTORISE $x^2 - x - 12$, HENCE SOLVE THE EQUATION $x^2 - x - 12 = 0$

$$x^2 - x - 12 = (x + 3)(x - 4)$$

$$(x + 3)(x - 4) = 0 \quad \therefore x = -3 \text{ and } x = 4$$

1. Factorise $x^2 + 3x - 10$.
Hence solve the equation $x^2 + 3x - 10 = 0$ [3]

2. a) Factorise $x^2 + 7x - 18$
b) Hence solve the equation $x^2 + 7x - 18 = 0$ [3]

3. Factorise the expression $4x^2 - 81$. Hence solve the equation $4x^2 - 81 = 0$ [3]

4. a) Factorise $2x^2 - 13x + 15$ [1]
b) Hence solve the equation $2x^2 - 13x + 15 = 0$ [2]