

### Tutorial 3 - Sheet 1

1. Simplify

$$(a) \quad 5x(5x^3) \quad (b) \quad -4x^2(3x) \quad (c) \quad 25y^2(3y^4)$$

2. Simplify

$$(a) \quad 5a + 4b - 2c + 9a - 11b + c \quad (b) \quad 7x^2 - 3x + 2y^2 + 4x - 3x^2 + 2$$

3. Remove the brackets from each of the following expressions and if possible simplify the result.

$$(a) \quad 4(y - 3x) \quad (b) \quad 5(x + 2) - 10(x + 3)$$

$$(c) \quad (4 - x)x^3 \quad (d) \quad x(x - 3) \quad (e) \quad x(x^2 + 3x + 2)$$

$$(f) \quad (x^2 + 9x + 7)x \quad (g) \quad -7(-x - 1)$$

4. Remove the brackets from each of the following expressions and if possible simplify the result.

$$(a) \quad (x + 7)(x + 1) \quad (b) \quad (4x + 3)(2x - 1) \quad (c) \quad (3x - 9)(x + 1)$$

$$(d) \quad (2x + 3)(-x) \quad (e) \quad (x + 3)^2$$

5. Factorise the following expressions:

$$(a) \quad 7x + 14 \quad (b) \quad 15x - 3y \quad (c) \quad 21x^2 + 7x$$

$$(d) \quad x^2 - 4y^2$$

6. Factorise the following quadratic expressions:

$$(a) \quad x^2 + 9x + 14 \quad (b) \quad x^2 - 9x + 14 \quad (c) \quad x^2 + x - 2$$

$$(d) \quad 6x^2 + 5x + 1$$

7. Simplify the following expressions:

$$(a) \quad \frac{12}{4x + 8} \quad (b) \quad \frac{12y}{3y^2 + y}$$

8. Express each of the following as a single fraction.

$$(a) \quad 5 - \frac{2}{x}$$

$$(b) \quad 2x + \frac{1}{x}$$

$$(c) \quad \frac{1}{a} + \frac{3}{b}$$

$$(d) \quad \frac{4}{t^2} + \frac{3}{t}$$

$$(e) \quad \frac{x}{2} + \frac{5x}{6}$$

$$(f) \quad \frac{3}{x+1} + \frac{2}{2x-1}$$

9. Simplify  $\frac{x^2 + 3x - 4}{x^2 + 4x - 5}$

10. Simplify  $(x-1) \times \frac{5x+5}{x^2-1}$