

## MCS 118

### Worksheet on simplifying algebraic expressions

1. Use exponent rules to simplify:

(a)  $(3x^2) \cdot (2x)^2$

(b)  $\frac{3x^{-2}}{9x^3}$

(c)  $\sqrt{x^2y^6}$

(d)  $4a^3 + 3a^4$

(e)  $(2x^3)(2x^4)$

(f)  $2^x + 2^x$

(g)  $x^3\sqrt[3]{x^6}$

2. Write each expression as a single fraction, with no negative exponents

(a)  $\frac{3x}{2y} \cdot \frac{2y^3x}{(2x)^2}$

(b)  $\frac{3x^{-2}y^5}{2y^3x^{-4}}$

(c)  $\frac{xy^2}{2y^{-3}x^2}$

(d)  $(\frac{2x}{3y^3})^2$

3. Factor each of the following polynomials.

(a)  $x^2 + x - 2$

(b)  $x^2 - 7x + 12$

(c)  $x^2 + 7x + 10$

(d)  $2x^2 - x - 1$

(e)  $x^2 - 9$

(f)  $100x^2 - 49$

(g)  $x^3 - 2x^2 - 24x$

4. Simplify each of the following fractions.

(a)  $\frac{x+1}{x} - \frac{1}{x-1}$

(b)  $\frac{1}{x-3} - \frac{2}{9-x^2}$

(c)  $\frac{2 - \frac{x}{y}}{2 + \frac{x}{y}}$

(d)  $\frac{x^2}{x^2-1} \cdot \frac{x^2+x-2}{x^3-2x^2-24x}$

(e)  $\frac{x}{\frac{x+1}{x^2}}$