National 5 Homework : 1 year course
Surds, Indices & Scientific Notation

1. Simplify:

(a) $\sqrt{200}$ (b) $\sqrt{2}\times\sqrt{2}\times\sqrt{5}$ (c) $5\sqrt{75}$ (d) $\sqrt{3}+4\sqrt{12}-\sqrt{27}$

2. Multiply out the brackets:

$\left(1+2\sqrt{3}\right)\left(2+\sqrt{3}\right)$

3. Rationalise the denominator and simplify where possible:

(a) $\frac{2}{\sqrt{3}}$ (b) $\frac{2}{\sqrt{8}}$ (c) $\frac{2\sqrt{3}}{3\sqrt{6}}$

4. Simplify and give each answer with a **positive** index:

(a) $3m^7\times 2m^2$ (b) $5x^6\times 2x^{-4}$ (c) $\frac{10x^6}{2x^3}$ (d) $\frac{a^{11}\times a^9}{a^{10}}$

(e) $\left(x^2\right)^5$ (f) $\left(2m^3\right)^3$ (g) $5y^2\times 3y^{-7}$ (h) $\frac{12d^2}{15d^4}$

5. Evaluate the following:

(a) $64^{\frac{1}{2}}$ (b) $8^{\frac{2}{3}}$ (c) $16^{\frac{-1}{4}}$ (d) $x^6\times x^7\times x^{-13}$

6. Write these numbers out in full:

(a) 5.26×10^5 (b) 4×10^4 (c) 2.24×10^{-5}

7. Write these numbers in scientific notation:

(a) 65700000000 (b) 0.00000456