Indices and Surds

Level 5 E&F HW - S5/6

Calculators are permitted but working must be shown.

$x^a \times x^b = x^{(a+b)}$ $x^a \div x^b = x^{(a-b)}$ $(x^a)^b = x^{(a\times b)}$ $x^{-n} = \frac{1}{x^n}$ $x^{\frac{1}{n}} = \sqrt[n]{x}$

Unit Assessment level:

1. Simplify:

a. $2a \times a^{-4}$ **b.** $15m^2 \div 3m^{-0.5}$ **c.** $5x^3 \times x^{-\frac{1}{2}}$

2. Simplify fully, giving your answer in surd form

a. $\sqrt{48}$ **b.** $\sqrt{40} + 4\sqrt{10} + \sqrt{90}$

3. On average, 1.5×10^5 vehicles cross the Kingston Bridge per day. How many vehicles would this be for a fortnight? Write your answer in Scientific Notation.

Assessment level:

4. Simplify:

a. $\frac{x^5 \times 10x}{2x^2}$ **b.** $\sqrt{2}(\sqrt{3} + \sqrt{2}) - \sqrt{6}$ **c.** $\frac{s^2}{t} \times \frac{3t}{2s}$

5. Evaluate: **a.** $8^{\frac{5}{3}}$ **b.** $(2^3)^{-2}$

6. Find the value of x

a. $\sqrt{x} + \sqrt{18} = 4\sqrt{2}$ **b.** $4 \times 2^x = 4$

7. Simplify: $\frac{4}{\sqrt{8}}$

8. A pollen sample weighs 12 grams and contains $1{\cdot}5 \times 10^9$ pollen grains.

Calculate the weight of one pollen grain in grams.

Write your answer in Scientific Notation.