Lesson 4

4.1 Converting answers out of index form

The work on indices has become fairly abstract.

Writing numbers in index form has become routine as has doing arithmetic with such numbers as, for example,

$$5^{-2}, \qquad 9^{\frac{1}{2}}, \qquad 7^0 \times 8^{\frac{1}{3}} = 8^{\frac{1}{3}} \qquad \text{and} \qquad \frac{1}{\sqrt{4}} = 4^{-\frac{1}{2}}$$

However, it's easy to stop understanding what numbers these actually represent !
This lesson addresses that issue.

4.2 "Together" Examples

Write each of the follow numbers, which are in index form, as ordinary numbers without any index.

(i) $\quad 5^{-2}$

(ii) $\quad 9^{\frac{1}{2}}$

(iii) $\quad 7^0$

(iv) $\quad 8^{\frac{1}{3}}$

(v) $\quad 4^{-\frac{1}{2}}$

(vi) $\quad 2^{-3}$

(vii) $\quad 11^{-1}$

(viii) $\quad 16^{\frac{1}{4}}$

4.3 "You Try" Examples

Write each of the follow numbers, which are in index form, as ordinary numbers without any index.

(i) 8^2

(ii) 7^{-1}

(iii) 3^{-2}

(iv) $36^{\frac{1}{2}}$

(v) 13^0

(vi) $125^{\frac{1}{3}}$

(vii) $9^{-\frac{1}{2}}$

(viii) 2^{-5}

(ix) 4^{-1}

(x) $16^{-\frac{1}{4}}$

Mega-Brain Challenge : $8^{\frac{2}{3}}$

Mega-Mega-Brain Challenge : $\left(\dfrac{\pi}{\sqrt{2} - (\sqrt{3})^7} \right)^0$

4.4 Exercise

Non - Calculator

For each question;

(**a**)   Write the answer in index form

(**b**)   Write your part (**a**) answer as an ordinary number without any index.

(**i**) $2^3 \times 2^{-7}$

(**ii**) $3^{-3} \times 3^2$

(**a**)   _____

(**a**)   _____

(**b**)   _____

(**b**)   _____

(**iii**) $5^{-1} \times 5^{-1}$

(**iv**) $\dfrac{7^4}{7^6}$

(**a**)   _____

(**a**)   _____

(**b**)   _____

(**b**)   _____

(**v**) $16^{\frac{1}{4}} \times 16^{\frac{1}{4}}$

(**vi**) $6^{-3} \times 6^2 \times 6^{-1}$

(**a**)   _____

(**a**)   _____

(**b**)   _____

(**b**)   _____

(vii) $\dfrac{10^7}{10^{11}}$

(viii) $\left(2^{-3}\right)^{-2}$

(a) _____

(a) _____

(b) _____

(b) _____

(ix) $\dfrac{4 \times 4 \times 4}{4 \times 4 \times 4 \times 4 \times 4}$

(x) $\left(2^2\right)^{-5}$

(a) _____

(a) _____

(b) _____

(b) _____

(xi) $\sqrt{10^{-6}}$

(xii) $\dfrac{8^8}{8^9}$

(a) _____

(a) _____

(b) _____

(b) _____