

# *Methods In Algebra*

Like terms can be added or subtracted, unlike terms cannot.

# *Index Laws*

$$a^m \times a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

$$(a^m)^n = a^{mn}$$

$$a^0 = 1$$

# *Index Meaning*

+ : top of the fraction (*same side*)

- : bottom of the fraction (*other side*)

$x^{\frac{a}{b}}$  ← power  
← root =  $\sqrt[b]{x^a}$

**OR**

$$= (\sqrt[b]{x})^a$$

e.g. (i)  $x^{-3} = \frac{1}{x^3}$

(ii)  $a^5 b^{-7} = \frac{a^5}{b^7}$

$$(iii) \frac{3}{4} x^{-4} a^9 b^{-2} = \underline{\underline{\frac{3a^9}{4x^4b^2}}}$$

$$(iv) x^{\frac{1}{4}} = \underline{\underline{\sqrt[4]{x}}}$$

$$(v) y^{\frac{2}{3}} = \underline{\underline{\sqrt[3]{y^2}}}$$

$$(vi) x^{\frac{3}{2}} = \sqrt{x^3}$$
$$= \sqrt{x^2 x}$$
$$= \underline{\underline{x\sqrt{x}}}$$

**OR**

see      think

$$x^{\frac{3}{2}} = x^{1\frac{1}{2}}$$
$$= \underline{\underline{x\sqrt{x}}}$$

$x^1$       and       $x^{\frac{1}{2}}$

$$(vii) m^{\frac{27}{4}} = \underline{m^{64}\sqrt[4]{m^3}}$$

$$(viii) \frac{1}{2} n^{-6} p^{500} q^{-\frac{1}{28}} c^{\frac{7}{6}} r^{69} = \underline{\frac{p^{500} c^6 \sqrt[6]{c} r^{69}}{2 n^6 \sqrt[28]{q}}}$$

$$(ix) \left(\frac{2}{3}\right)^{-2} = \left(\frac{3}{2}\right)^2 \\ = \frac{9}{4} \\ \underline{\hspace{1cm}}$$

$$(x) \text{ Solve } 9^{4x+1} = \frac{1}{27} \\ 3^{8x+2} = 3^{-3} \\ 8x + 2 = -3 \\ 8x = -5 \\ x = \underline{-\frac{5}{8}}$$

**Exercise 1A; 8a, 9g, 10d, 11b, 12ad, 13cf, 14bc, 15b, 16ac,  
17bd, 18bd, 19\***

**Exercise 8A; 5af, 6bg, 10cgj, 13ej, 14bdfhj, 15adf, 16af, 21cd**

**Exercise 8B; 2afi, 3cfh, 8cg, 9gh, 11eh, 13dgh, 17chj**