Indices

Level 3

Please revise Level 1 and 2

Note

$9^{\frac{1}{2}} \times 9^{\frac{1}{2}} = 9^1 = 3 \times 3$

i.e. $9^{\frac{1}{2}} = \sqrt{9}$

Similarly $27^{\frac{1}{3}} = \sqrt[3]{27} = 3$

Examples

$(2^5)^{\frac{1}{5}} = 2^1$

i.e. $(32)^{\frac{1}{5}} = 2$

Similarly

$81^{\frac{3}{4}} = \sqrt[4]{81^3} = (3^4)^{\frac{3}{4}} = 3^3 = 27$

$125^{\frac{2}{3}} = (5^3)^{\frac{2}{3}} = 5^2 = 25$

$8^{-\frac{1}{3}} = (2^3)^{-\frac{1}{3}} = 2^{-1} = ½$

Practise Simplify and express with positive indices

a) $27^{-\frac{1}{3}}$

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

c) $(9c^2)^{\frac{1}{2}}$

d) $(27d^6)^{\frac{2}{3}}$

e) $(4e^6)^{-\frac{1}{2}}$

f) $(2f) \times (16f^4)^{0.5}$

g) $(8g^6)^{-2/3} \div 4^{-1/2} g^2$

h) $1000^{1/3} \div 5h^{-2}$

j) $12j^0 \div (8j^6)^{2/3}$

k) $(16k^4)^{3/4} \div 16k^0$

m) $(4m^3)^{-2} \div (25m^8)^{0.5}$

n) $(9n^{-4})^{-2} \div (243n^{10})^{-0.2}$

p) $\left(\frac{9p^0 \times 16p^{-2}}{9p^2} \right)^{0.5}$

q) $(25q^2)^{-\frac{1}{2}} \times (27q^3)^{\frac{1}{3}}$

r) $\left(\frac{16r^{-2} \times (2r)^{-3}}{(6^{-1})(r^{-2})} \right)^2$

s) $\frac{(3s^{-2})^{-3} \times 4s^3}{(25^{-1}(s^6)^{-2}}$

t) $\frac{5^2 t^{-3}}{(3^{-3} t^2)^{-4}}$

u) $\frac{(9u)^{-4} \times (4u^2)^{-0.5}}{(2u^{-2})^{-1}}$