

Laws of Indices :

① Without a calculator and by showing all steps., evaluate the following

a) $9^{1/2}$

b) $8^{1/3}$

c) $100^{-1/2}$

d) 5^{-2}

e) $8^{2/3}$

f) $9^{3/2}$

g) $27^{-2/3}$

h) $16^{-3/4}$

② Simplify the following

a) $\frac{x^4 \times x^3}{x^9}$

b) $\frac{x^3 \times x^{-7}}{x^{-5}}$

c) $\frac{(x^{-2})^4 \times x^3}{(x^{-3})^{-4}}$

d) $(2x^3)^3 \times (3x^2)^2$

e) $x^{1/2} \times x^{1/5}$

f) $\frac{x^{2/3} \times x^{-3/4}}{x^{1/2}}$

③ Simplify the following

a) $\sqrt{x} \times \frac{1}{x}$

b) $\sqrt[3]{x} \times \sqrt{x}$

c) $\sqrt[3]{x^2} \times \frac{1}{x^2}$

d) $\sqrt{x^3} \times \frac{1}{\sqrt{x}}$

④ Expand these brackets

a) $\sqrt{x} \left(x - \frac{1}{x} \right)$

b) $\sqrt[3]{x} \left(\sqrt{x} + \sqrt[3]{x^2} \right)$

⑤ Solve these equations

a) $2^{8x} = 8^{x+1}$

b) $3^{x-2} = 9^{4x}$

c) $8^{x+3} = 16^{x-2}$

d) $27^{2x+1} = 9^{x-2}$

e) $\left(\frac{1}{100} \right)^{2x} = 10^{2x+1}$

f) $\left(\frac{1}{16} \right)^x = \left(\frac{1}{8} \right)^{3x-1}$