

1) Simplify each of the following.

a) $\frac{4^{n+1} \times 2^{2n+1} \times 8^n}{32^n}$

b) $\frac{3^{2n} \times 27^{n-2} \times 6^n}{3^{n-6} \times 9^{2n}}$

c) $\frac{12^{2n} + 16^n}{3^{2(n+1)} + 9}$

d) $\frac{10^n + 2^{5n}}{20^n + 4^{3n}}$

e) $\frac{p + 1.5 - (p)^{-1}}{2p - (2p)^{-1}}$

f) $\frac{2 - 2(2p)^{-1}}{6p + 1 - 2p^{-1}}$

2) Solve each of the following exponential equation.

a) $2^{2x} - 8(2)^x + 16 = 0$

b) $5^{2x} - 26(5)^x + 25 = 0$

c) $(27 \times 3^x)^x = 27^x \times 3^{0.25}$

d) $2(4)^x - 17(2)^x + 8 = 0$

e) $2^{2x+3} - 3(2^{x+1}) + 1 = 0$

f) $x^{\frac{4}{3}} - 13x^{\frac{2}{3}} = -36$

g) $2^{2+x} - 2^{2-x} = 15$

h) $2^x + 2^{2-x} = 5$

i) $(x-5)^{\frac{2}{3}} = (27)^{\frac{-1}{9}}$

j) $3^{x+2} + 3^x = 810$

Answers

1a) 2^{2n+3}

b) 6^n

c) $\frac{16^n}{9}$

d) $\frac{1}{2^n}$

e) $\frac{p+2}{2p+1}$

f) $\frac{1}{3p+2}$

2a) 2

b) 0 or 2

c) ± 0.5

d) -1 or 3

e) -2 or -1

f) 8 or 27

g) 2

h) 0 or 2

i) $\frac{15 \pm \sqrt{3}}{3}$

j) 4