

Question (14): find the value of x in each of the following:

(i) $\sqrt{5x+2} = 2$

Ans: $x=6$

(ii) $\sqrt[3]{3x-2} = 4$

Ans: $x=22$

(iii) $\left(\frac{3}{4}\right)^3 \left(\frac{4}{3}\right)^{-7} = \left(\frac{3}{4}\right)^{2x}$

Ans: $x=5$

(iv) $5^{x-3} \times 3^{x-8} = 225$

Ans: $x=5$

(v) $\frac{3^{3x} \cdot 3^{2x}}{3^x} = \sqrt[4]{3^{60}}$

Ans: $x = \frac{5}{4}$

Question (15): Prove that

(i) $\sqrt{x^{-1}y} \cdot \sqrt{y^{-1}z} \cdot \sqrt{z^{-1}x} = 1$

(ii) $\left(x^{\frac{1}{a-b}}\right)^{\frac{1}{a-c}} \cdot \left(x^{\frac{1}{b-c}}\right)^{\frac{1}{b-a}} \cdot \left(x^{\frac{1}{c-a}}\right)^{\frac{1}{c-b}} = 1$

(iii) $\frac{x^{a(b-c)}}{x^{b(a-c)}} \div \left(\frac{x^b}{x^a}\right)^c = 1$

(iv) $\frac{(x^{a+b})^2 \cdot (x^{b+c})^2 \cdot (x^{c+a})^2}{(x^a \cdot x^b \cdot x^c)^4} = 1$

Question 16: if x is a positive real number and exponents are rational numbers, simplify.

$\left(\frac{x^b}{x^c}\right)^{b+c-a} \cdot \left(\frac{x^c}{x^a}\right)^{c+a-b} \cdot \left(\frac{x^a}{x^b}\right)^{a+b-c}$

Ans: 1

Question 17: If $\frac{9^m \times 3^e \times (3^{-m/2})^{-2} - (27)^n}{3^{3m} \times 2^3} = \frac{1}{27}$

prove that $m-n=1$

Question 18: write the following in ascending order of magnitude.

$\sqrt{6}, \sqrt[3]{7}, \sqrt[4]{8}$

Ans: $\sqrt{6} < \sqrt[4]{8} < \sqrt[3]{7}$