
$$= \frac{1}{2} + \frac{1}{\frac{1}{10^{2\times\frac{1}{2}}}} - 3^2$$

$$x = \frac{1}{2} + \frac{1}{\frac{1}{10}} - 3^2$$

$$= \frac{1}{2} + 1 \times \frac{10}{1} - 3 \times 3$$

$$= \frac{1}{2} + 10 - 9$$

$$= \frac{3}{2}$$

Hence, $\sqrt{\frac{1}{4}} + (0.01)^{\frac{-1}{2}} - (27)^{\frac{2}{3}} = \frac{3}{2}$

(vi) We have to prove that $\frac{2^n+2^{n-1}}{2^{n+1}-2^n}=\frac{3}{2}$ . So,

Let $x=\frac{2^n+2^{n-1}}{2^{n+1}-2^n}$

$$x=\frac{2^n+2^{n-1}}{2^{n+1}-2^n}$$

$$=\frac{2^n\left(1+1\times 2^{-1}\right)}{2^n\left(2^1-1\right)}$$

$$=\frac{\cancel{2^n}\left(1+1\times 2^{-1}\right)}{\cancel{2^n}\left(2^1-1\right)}$$

$$=\frac{\left(1+\frac{1}{2}\right)}{2-1}$$

$$\Rightarrow x=\frac{3}{2}$$

Hence, $\frac{2^n+2^{n-1}}{2^{n+1}-2^n}=\frac{3}{2}$

(vii) We have to prove that $\left(\frac{64}{125}\right)^{\frac{-2}{3}}+\frac{1}{\left(\frac{256}{625}\right)^{\frac{1}{4}}}+\left(\frac{\sqrt{25}}{\sqrt[3]{64}}\right)=\frac{65}{16}$ . So let

$$x=\left(\frac{64}{125}\right)^{\frac{-2}{3}}+\frac{1}{\left(\frac{256}{625}\right)^{\frac{1}{4}}}+\left(\frac{\sqrt{25}}{\sqrt[3]{64}}\right)$$

$$x=\frac{2^{6\times-\frac{2}{3}}}{5^{3\times\frac{-2}{3}}}+\frac{1}{\frac{2^{8\times\frac{1}{4}}}{5^{4\times\frac{1}{4}}}}+\frac{\sqrt{5\times 5}}{\sqrt[3]{4\times 4\times 4}}$$

$$=\frac{2^{\cancel{6}\times-\frac{2}{\cancel{3}}}}{5^{\cancel{3}\times\frac{-2}{\cancel{3}}}}+\frac{1}{\frac{2^{\cancel{8}\times\frac{1}{\cancel{4}}}}{5^{\cancel{4}\times\frac{1}{\cancel{4}}}}}+\frac{5}{4}$$

$$=\frac{2^{-4}}{5^{-2}}+\frac{1}{\frac{2^2}{5}}+\frac{5}{4}$$

$$= \frac{\frac{1}{2^4}}{\frac{1}{5^2}} + \frac{5}{2^2} + \frac{5}{4}$$

$$\Rightarrow x = \frac{1}{16} \times \frac{25}{1} + \frac{5}{4} + \frac{5}{4} = \frac{65}{16}$$

By taking least common factor we get

$$x = \frac{25+20+20}{16} = \frac{65}{16} = \frac{65}{16}$$

Hence, $\left(\frac{64}{125}\right)^{\frac{-2}{3}} + \frac{1}{\left(\frac{256}{625}\right)^{\frac{1}{4}}} + \left(\frac{\sqrt{25}}{3\sqrt{64}}\right) = \frac{65}{16}$

*********** END **********