INDICES - EXPONENTS

1. Multiply:- $3xy^2z$, $4x^2yz^5$ and $5x^3y^6z^7$
2. Divide: - $175x^{17}y^{26}z^{10}$ by $35x^9y^{17}z^9$.
3. What is meaning must be given to $16^{1/2}$?
4. What is meaning must be given to $27^{1/3}$?
5. What is meaning must be given to $a^{3/4}$?
6. Find the values of (i) $36^{1/2}$, (ii) $16^{3/4}$ and (iii) $\left(\frac{27}{64}\right)^{-2/3}$
7. Simplify:
   i. $X^{2a+b-c}.x^{2c+a-b}.x^{2b+c-a}$
   ii. $\frac{4mn(7m^2n^3)}{14m^3n^3}$
   iii. $\left(\frac{a^2b^2}{x^2y^3}\right)^m$
   iv. $\left(\frac{123}{8}\right)^{\frac{-2}{3}}$
8. Simplify:
   i. $(32)^{\frac{4}{5}}+\left(\frac{1}{81}\right)^{\frac{-3}{4}}-\left(\frac{1}{125}\right)^{\frac{-2}{3}}-6°\times 16^{3/2}$.
   ii. $\left[\left\{\sqrt[4]{x^{-3/4}}\right\}^{-4/3}\right]^4$
9. Simplify:
   i. $\frac{7^{n+2}-3.7^{n+1}}{20.7^n-2.7^{n+1}}$
   ii. $\frac{(125)^{2n/3}\times(27)^{-n/6}}{(75)^{-n/2}}$
10. Prove that :
    i. $\left(\frac{x^{a+b}}{x^c}\right)^{a-b}.\left(\frac{x^{c+a}}{x^b}\right)^{c-a}.\left(\frac{x^{b+c}}{x^a}\right)^{b-c}=1.$
    ii. $\frac{1}{1+x^{a-b}}+\frac{1}{1+x^{b-a}}=1$
    iii. $\left(\frac{x^a}{x^b}\right)^{a^2-ab+b^2}.\left(\frac{x^b}{x^c}\right)^{b^2+bc+c^2}.\left(\frac{x^c}{x^a}\right)^{c^2+ca-a^2}=1.$
11. Given $4725=3^x.5^y.7^z$, find
    (i) The numerical value of x, y and z
    (ii) The value of $2^{-x}.3^y.7^z$ as a fraction.

    (a)If $x^a=y$, y^b=z, $z^c=x$; prove that abc =1

    (b)If $2^x=7^{-y}=14^z$, prove that $\frac{1}{x}=\frac{1}{y}+\frac{1}{z}$.