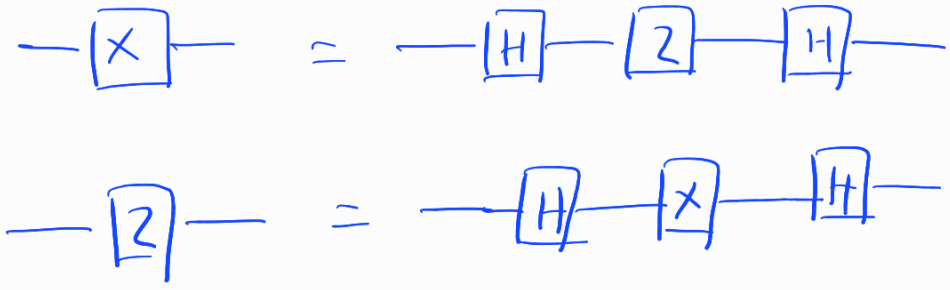
Q) Show 

Ans:

$$HXH = \frac{1}{\sqrt{2}}\begin{vmatrix} 1 & 1 \\ 1 & -1 \end{vmatrix} \begin{vmatrix} 0 & 1 \\ 1 & 0 \end{vmatrix} \frac{1}{\sqrt{2}}\begin{vmatrix} 1 & 1 \\ 1 & -1 \end{vmatrix}$$

$$= \begin{vmatrix} 1 & 0 \\ 0 & -1 \end{vmatrix}$$

$$= Z$$

Given,

$$H = \frac{1}{\sqrt{2}}\begin{vmatrix} 1 & 1 \\ 1 & -1 \end{vmatrix}$$

$$X = \begin{vmatrix} 0 & 1 \\ 1 & 0 \end{vmatrix}$$

$$HZH = \frac{1}{\sqrt{2}}\begin{vmatrix} 1 & 1 \\ 1 & -1 \end{vmatrix} \begin{vmatrix} 1 & 0 \\ 0 & -1 \end{vmatrix} \frac{1}{\sqrt{2}}\begin{vmatrix} 1 & 1 \\ 1 & -1 \end{vmatrix}$$

$$= \begin{vmatrix} 0 & 1 \\ 1 & 0 \end{vmatrix}$$

$$= X$$

Proved