Solution

a. Z varies directly as x and inversely as twice the cube root of y is written as $Z \,\alpha\, \frac{x}{2(\sqrt[3]{y})}$

which is equal to $Z = \frac{kx}{2(\sqrt[3]{y})}$. k is constant

Since Z = 8, x = 4, $y = \frac{1}{8}$, substitute them in place of the variables.

$8 = \frac{4k}{2(\sqrt[3]{\frac{1}{8}})}$

Cubic Root of $\frac{1}{8}$ is $\frac{1}{2}$

$8 = \frac{4k}{2(\frac{1}{2})}$

$8 = \frac{4k}{\cancel{2}(\frac{1}{\cancel{2}})}$

8 = 4k

$\frac{8}{4} = \frac{4}{4}k$

2 = k

∴K = 2

This gives: $Z = \frac{2x}{2(\sqrt[3]{y})}$

$Z = \frac{x}{\sqrt[3]{y}}$

$Z(\sqrt[3]{y}) = (x)$

$[Z(\sqrt[3]{y})]^3 = (x)^3$

$(Z^3(\cancel{\sqrt[3]{y}})^{\cancel{3}} = x^3$

$Z^3y = x^3$

$$\frac{Z^3 y}{Z^3} = \frac{x3}{Z^3}$$

$$Y = \frac{x3}{Z^3}$$

$$Y = \left(\frac{x}{z}\right)^3$$