

$\therefore$ Given series is convergent

So
$$\lim_{n \rightarrow \infty} a^{1/n} - \left(\frac{b^{1/n} + c^{1/n}}{2} \right) = 0$$

$\therefore \frac{b^{1/n} + c^{1/n}}{2} > \sqrt{b^{1/n} c^{1/n}} \quad (\text{A.M.} > \text{G.M.})$

$$\lim_{n \rightarrow \infty} a^{1/n} = (bc)^{\frac{1}{2n}} = 0$$

$$\Rightarrow a^{1/n} = (bc)^{\frac{1}{2n}}$$

$$\Rightarrow a = (bc)^{\frac{1}{2}} = \sqrt{bc}$$

$$\left\{ \begin{aligned} & \Rightarrow \sqrt{(bc)^{1/n}} \\ & = ((bc)^{1/n})^{\frac{1}{2}} \\ & = (bc)^{\frac{1}{2n}} \end{aligned} \right.$$