

936

$$\prod_{n=1}^{\infty} \left(1 + \frac{z^4}{n^4}\right) = \prod \left(1 - i^2 \left(\frac{z^4}{n^4}\right)\right) =$$

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

$$= \prod \left(1 - \left(\frac{i^{\frac{1}{2}} z}{n}\right)^2\right) \prod \left(1 - \left(\frac{i^{\frac{3}{2}} z}{n}\right)^2\right) =$$

$$= \frac{1}{i^{\frac{1}{2}} z \pi} \operatorname{Sin}(\pi z \pi) \frac{1}{i^{\frac{3}{2}} z \pi} \operatorname{Sin}(i^{\frac{3}{2}} z \pi)$$

$$\sqrt{i} = i^{\frac{1}{2}} = \exp\left(\frac{1}{2} \operatorname{Log} i\right) = \exp\left(\frac{1}{2} \cdot \frac{\pi}{2} i\right) = \exp\left(\frac{\pi}{4} i\right) = \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2} i$$

$$\sqrt{z} = \exp\left(\frac{1}{2} \operatorname{Log} z\right)$$

$$(\sqrt{z})^2 = \exp(\operatorname{Log} z) = z$$

