$$t = \sum_{k=1}^{\infty} \tan^{-1}\left[\frac{1}{2k^2}\right]$$

$$= \sum_{k=1}^{\infty} \tan^{-1}\left[\frac{(2k+1)-(2k-1)}{1+4k^2-1}\right]$$

$$= \sum_{k=1}^{\infty} \left[\tan^{-1}(2k+1) - \tan^{-1}(2k-1)\right]$$

$$= \tan^{-1}3 - \tan^{-1}1 + \tan^{-1}5 - \tan^{-1}3 \cdots + \tan^{-1}(2n+1) - \tan^{-1}(2n-1)$$

$$\cdots\cdots + \infty$$

$$= \lim_{n\to\infty}\left[\tan^{-1}(2n+1) - \tan^{-1}1\right]$$

$$= \lim_{n\to\infty} \tan^{-1}\left[\frac{2n}{1+(2n+1)}\right] = \lim_{n\to\infty} \tan^{-1}\left[\frac{1}{1+\frac{1}{n}}\right]$$

$$= \tan^{-1}(1) = \frac{\pi}{4},$$

$$\tan t = 1.$$