Вспомним что:

$$\sin x = Ax \prod_{n=1}^{\infty} \left(1 - \frac{x^2}{\pi^2 n^2}\right) = Ax \left[1 - \frac{x^2}{\pi^2}\left(1 + \frac{1}{2^2} + \frac{1}{3^2} + \ldots\right) + \frac{x^4}{\pi^4}\alpha_4 + \frac{x^6}{\pi^6}\alpha_6 + \ldots\right]$$

Теперь:

$$\sin x = x - \frac{x^3}{6} + \frac{x^5}{120} - \ldots$$

и финт ушами:

$$\left(1 + \frac{1}{2^2} + \frac{1}{3^2} + \ldots\right)^2 = 1 + \frac{1}{2^4} + \frac{1}{3^4} + \ldots + 2\alpha_4$$

Ба-бах:

$$1 + \frac{1}{2^4} + \frac{1}{3^4} + \ldots = \frac{\pi^4}{36} - 2\frac{\pi^4}{120} = \frac{\pi^4}{90}$$