$$a_n = \frac{4^n + 9}{3^{2n}} = \frac{4^n}{3^{2n}} + \frac{9}{3^{2n}}$$

$$\sum_{n=1}^{\infty} \frac{4^n}{3^{2n}} + \sum_{n=1}^{\infty} \frac{9}{3^{2n}} = \underbrace{\sum_{n=1}^{\infty} \left(\frac{4}{3^2}\right)^n}_{a} + \underbrace{\sum_{n=1}^{\infty} \frac{9}{3^{2n}}}_{b}$$

a)

$$R_a = \frac{\left(\frac{4}{3^2}\right)^{n+1}}{\left(\frac{4}{3^2}\right)^{n}} = \frac{\frac{4}{9}}{\frac{1}{1}} = \frac{4}{9} < 1$$

a é convergente

$$S_a = \frac{a}{1 - R_a} = \frac{\frac{4}{9}}{1 - \frac{4}{9}} = \frac{\frac{4}{9}}{\frac{5}{9}} = \frac{4}{5}$$

b)

$$R_b = \frac{\frac{9}{3^{2n+2}}}{\frac{9}{3^{2n}}} = \frac{\frac{9}{3^2}}{\frac{9}{1}} = \frac{1}{9} < 1, \text{ b é conv.}$$

$$S_b = \frac{1}{1 - \frac{1}{9}} = \frac{1}{\frac{8}{9}} = \frac{9}{8}$$

$$S_{total} = \frac{4}{5} + \frac{9}{8} = \frac{77}{40}$$