Studio serie

1) Somma delle serie di:

$$\sum_{n=1}^{+\infty} 4^{-n} = \sum_{n=1}^{+\infty} \left(\frac{1}{4}\right)^n \rightarrow \frac{1}{1-\frac{1}{4}} - 1 \rightarrow \frac{4}{3} - 1 \rightarrow \frac{1}{3}$$

2)

$$\sum_{n=1}^{\infty} 4^{-n} = \left(\frac{1}{4}\right)^n = \frac{1}{1-\frac{1}{4}} - 1 = \frac{4}{3} - 1 = \frac{1}{3}$$

3)

$$\sum_{n=1}^{+\infty} e^{1-2n} = \frac{e}{e^{2n}} \rightarrow e \sum \frac{1}{e^{2n}} = \frac{1}{e^n * e^n} = \left(\frac{1}{e*e}\right)^n = \frac{1}{e^2}^n$$

$$e * \left(\frac{1}{1-\frac{1}{e^2}} - 1\right) = e * \left(\frac{1}{\frac{e^2-1}{e^2}} - 1\right) = e * \left(\frac{e^2}{e^2-1} - 1\right)$$

$$e * \frac{e^2 - e^2 + 1}{e^2 - 1} = \frac{e}{e^2 - 1}$$

4)

$$\sum_{n=0}^{+\infty} \frac{2^{2n}}{3} = \frac{4^n}{9} = \frac{1}{1-q} = \frac{1}{\frac{9}{9} - \frac{4}{9}} = \frac{9}{5}$$