$$\sum_{k=2}^{\infty}\left(\frac{2}{3}\right)^k = \sum_{k=1}^{\infty}\left(\frac{2}{3}\right)^{k+1} \tag{1}$$

$$= \sum_{k=1}^{\infty}\left(\frac{2}{3}\right)^k - \frac{2}{3} \tag{2}$$

$$= \sum_{k=1}^{\infty}\left(\frac{2}{3}\right)^{k-1} - \frac{2}{3} - 1 \tag{3}$$

$$= \frac{1}{1-2/3} - \frac{2}{3} - 1 \tag{4}$$

$$= 3 - 5/3 = 4/3.$$