Exercícios

Exercício 1

$$\sum_{k=1}^{n} a^k =$$

$$Sn = \sum_{k=1}^{n} a^k$$

$$S_{n+1} = S_n + a^{n+1} = \sum_{k=1}^{n+1} a^k$$

$$= a^1 + \sum_{k=2}^{n+1} a^k \text{ (Separação)}$$

$$= a + \sum_{k=1}^{n} a^{k+1} \text{ (Reindexação)}$$

$$= a + \sum_{k=1}^{n} a^k * a^1$$

$$= a + a * \sum_{k=1}^{n} a^k \text{ (Distributividade)}$$

$$S_n + a^{n+1} = a + a * S_n$$

$$S_n - a * S_n = a - a^{n+1}$$

$$S_n(1 - a) = a - a^{n+1}$$

$$S_n = (a - a^{n+1}) / (1 - a)$$ → resposta final

Exercício 2

$$\sum_{i=1}^{n} \frac{2^{i+1}}{5^i}$$

$$Sn+1=Sn+\frac{(2^{n+2})}{5^{n+1}}=\sum_{i=1}^{n+1} \frac{2^{i+1}}{5^i}$$

$$Sn+\frac{(2^{n+2})}{5^{n+1}}=\frac{4}{5}+\sum_{i=2}^{n+1} \frac{2^{i+1}}{5^i}$$

$$Sn+\frac{(2^{n+2})}{5^{n+1}}=\frac{4}{5}+\sum_{i=1}^{n} \frac{2^{i+1+1}}{5^{i+1}}$$

$$Sn+\frac{(2^{n+2})}{5^{n+1}}=\frac{4}{5}+\sum_{i=1}^{n} \frac{2^{i+2}}{5^{i+1}}$$

$$Sn+\frac{(2^{n+2})}{5^{n+1}}=\frac{4}{5}+\sum_{i=1}^{n} \frac{2^{i+1}}{5^i}\cdot\frac{2^1}{5^1}$$

$$Sn+\frac{(2^{n+2})}{5^{n+1}}=\frac{4}{5}+\frac{2}{5}\sum_{i=1}^{n} \frac{2^{i+1}}{5^i}$$

$$Sn+\frac{(2^{n+2})}{5^{n+1}}=\frac{4}{5}+\frac{2}{5}Sn$$

$$\frac{(2^{n+2})}{5^{n+1}}-\frac{4}{5}=\frac{2}{5}Sn-Sn$$

$$\frac{(2^{n+2})}{5^{n+1}}-\frac{4}{5}=\frac{2}{5}Sn-Sn$$

$$\frac{-3}{5}Sn=\frac{2^{n+2}}{5}n+1-\frac{4}{5}$$

$$Sn=\frac{\frac{2^{n+2}}{5^{n+1}}-\frac{4}{5}}{\frac{-3}{5}}$$

$$Sn=(\frac{2^{n+2}}{5^{n+1}}-\frac{4}{5})\cdot\frac{-5}{3}$$

$$Sn=\frac{-5}{3}(\frac{2^{n+2}}{5^{n+1}})+\frac{4}{3}$$ → **resposta final**

Exercício 3

$$\sum_{i=1}^{n} 7i-3$$

$$Sn=\sum_{i=1}^{n} 7i-3$$

$$Sn=\sum_{i=1}^{n} 7i-\sum_{i=1}^{n} 3$$

$$Sn=7\left(\sum_{i=1}^{n} i\right)-3n$$

$$Sn=7\frac{(n(n+1))}{2}-3n$$

$$Sn=\frac{7n^2+7n}{2}-3n$$

$$Sn=\frac{7n^2+7n-6n}{2}$$

$$Sn=\frac{7n^2+n}{2} \quad \rightarrow \text{ resposta final}$$