

Tarea n° 2 Matemática I:

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$$a) \sum_{k=2}^n \left(\frac{\sqrt{5k+3} - \sqrt{5k-2}}{\sqrt{25k^2 + 5k - 6}} - \frac{3^{k-4} \cdot 6^k - 4}{2^{k+2}} \right)$$

$$i) \sum_{k=2}^n \frac{\sqrt{5k+3} - \sqrt{5k-2}}{\sqrt{25k^2 + 5k - 6}} =$$

$$\frac{\sqrt{5k+3} - \sqrt{5k-2}}{\sqrt{(5k+3)(5k-2)}} = \frac{1/\sqrt{(5k+3)(5k-2)}}{1/\sqrt{(5k+3)(5k-2)}}$$

$$\frac{(5k+3)\sqrt{5k-2} - (5k-2)\sqrt{5k+3}}{(5k+3)(5k-2)} =$$

$$\frac{\cancel{(5k+3)}\sqrt{5k-2}}{\cancel{(5k+3)}(5k-2)} - \frac{(5k-2)\sqrt{5k+3}}{(5k+3)\cancel{(5k-2)}} =$$

$$\frac{\sqrt{5k-2}}{(5k-2)} - \frac{\sqrt{5k+3}}{5k+3} =$$

$$\left. \begin{array}{l} \text{se explica así:} \\ \sqrt{b}/b = b^{1/2}/b = b^{-1/2} = \frac{1}{\sqrt{b}} \end{array} \right\}$$

$$\frac{1}{(5K-2)} - \frac{1}{5K+3} =$$

se explica así:

$$\sqrt{b}/b = b^{1/2}/b = b^{-1/2} = \frac{1}{\sqrt{b}}$$

$$\frac{1}{\sqrt{5K-2}} - \frac{1}{\sqrt{5K+3}} =$$

sea $a_K = \frac{1}{\sqrt{5K-2}}$ y $a_{(K+1)} = \frac{1}{\sqrt{5(K+1)-2}} = \frac{1}{\sqrt{5K+3}}$

Entonces:

$$\sum_{K=1}^n \frac{1}{\sqrt{5K-2}} - \frac{1}{\sqrt{5K+3}} - \sum_{K=1}^1 \frac{1}{\sqrt{5K-2}} - \frac{1}{\sqrt{5K+3}} =$$

$$\downarrow \quad \downarrow$$

$$a_K - a_{n+1} - \left(\frac{1}{\sqrt{3}} - \frac{1}{\sqrt{8}} \right) =$$

$$\frac{1}{\sqrt{3}} - \frac{1}{\sqrt{5(n+1)-2}} - \frac{1}{\sqrt{3}} + \frac{1}{\sqrt{8}} =$$

i) $-\frac{1}{\sqrt{5n+3}} + \frac{1}{\sqrt{8}} //$

$$\text{ii)} \quad \sum_{k=2}^n \frac{3^{k-4} \cdot 6^k - 4}{2^{k+2}}$$

$$\frac{3^{k-4} \cdot 6^k - 2^2}{2^{k+2}} = \frac{3^{2k-4} \cdot 2^k - 2^2}{2^{k+2}} = \frac{2^{k+2} \cdot (3^{2k-4} \cdot 2^{-2} - 2^{-k})}{2^{k+2}}$$

$$\sum_{k=2}^n 3^{2k-4} \cdot 2^{-2} - \sum_{k=2}^n 2^{-k} = \frac{1}{4} \sum_{k=2}^n 3^{2k-4} - \sum_{k=2}^n 2^{-k}$$

$$\frac{1}{4} \sum_{k=2}^n (3^2)^{k-2} - \sum_{k=2}^n \left(\frac{1}{2}\right)^k = \frac{1}{4} \sum_{k=2}^n 9^{k-2} - \sum_{k=2}^n \left(\frac{1}{2}\right)^k$$

$$\frac{1}{4} \sum_{k=2}^n 9^k \cdot 9^{-2} - \sum_{k=2}^n \left(\frac{1}{2}\right)^k$$

$$\frac{1}{4} \cdot \frac{1}{81} \sum_{k=2}^n 9^k - \sum_{k=2}^n \left(\frac{1}{2}\right)^k$$

Fórmula geométrica: $\sum_{k=m}^n r^k = \frac{r^m - r^{n+1}}{1-r}$

Formula Geometrica : $\sum_{k=m}^n r^k = \frac{-r^{n+1} - (-r^m)}{1-r}$ ✓

$$\frac{1}{324} \cdot \left(\frac{9^2 - 9^{n+1}}{1-9} \right) - \left(\frac{\left(\frac{1}{2}\right)^2 - \left(\frac{1}{2}\right)^{n+1}}{1 - \frac{1}{2}} \right)$$

$$\frac{1}{324} \cdot \frac{9 \cdot 9 - 9^n \cdot 9}{-8} - \left(\frac{\frac{4}{9} - \left(\frac{1}{2}\right)^n \cdot \left(\frac{1}{2}\right)}{\frac{1}{2}} \right)$$

i) - ii)

$$R: - \frac{1}{\sqrt{5n+3}} + \frac{1}{\sqrt{8}} - \left[\frac{1}{324} \left(\frac{81 - 9^{n+1}}{-8} \right) - \left(\frac{\frac{4}{9} - \left(\frac{1}{2}\right)^{n+1}}{\frac{1}{2}} \right) \right]$$

truy bien! //