

Subtracting A Sequence In The Form: $\frac{1}{a} - \frac{1}{a^2} - \dots - \frac{1}{a^n}$

A. To solve this sequence the denominator is always a^n , and the numerator is:

$$(a^{n-1} - a^{n-2} - \dots - a - 1)$$

B. Basically what this says is take the next to last denominator and subtract every value to its left from that then subtract 1.

C. Examples

Ex [1] $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} - \frac{1}{16} =$ _____

- The denominator is 16.
- The numerator is $8 - 4 - 2 - 1 = 1$.
- The answer is $\frac{1}{16}$.

Ex [2] $\frac{1}{4} - \frac{1}{16} - \frac{1}{64} - \frac{1}{256} =$ _____

- The denominator is 256.
- The numerator is $64 - 16 - 4 - 1$ or $64 - 20 - 1 = 43$.
- The answer is $\frac{43}{256}$.

D. In problems like Ex [1] where the denominator are 2^n , the answer will always be $\frac{1}{2^n}$.