Answer on Question 42507, Math, Calculus

It is obvious, that the given sequence might be rewritten as $2^4 \cdot 3^1, 2^3 \cdot 3^0, 2^2 \cdot 3^{-1}, 2^1 \cdot 3^{-2} ...$. Thus, general formula for nth term is $a_n = 2^{4-n} 3^{-(n-1)}$, or $a_n = 48 \cdot \dfrac{1}{6^n}$. This sequence converges, because it is a geometric progression with $q = \dfrac{1}{6}$, multiplied by 48. Thus, the sum is

$$S = 48 \cdot \frac{1}{1 - \dfrac{1}{6}} = \frac{288}{5} .$$