Question #3934

$\sum_{k=0}^{\infty}(-1/5)^k$.

$\sum_{k=1}^{\infty} 3^k/7^k - 5^k/7^k$

$\sum_{k=0}^{\infty} \frac{1}{k+1}$

Solution. First, note that the third row diverges as harmonic, so the sum is equal to $+\infty$. To sum the firs and the second, one might use the formula for sum of geometric progression.The first one $\frac{1}{1+1/5} = 5/4$, the second is equal to $\frac{3/7}{1-3/7} - \frac{5/7}{1-5/7} = 3/4 - 5/2 = -7/4$.

Answer. 1)5/4, 2) $-7/4$ 3) diverges.