1) Prove that for all integers \( n \geq 1 \)

\[
\frac{1}{3} = \frac{1+3}{5+7} = \frac{1+3+5}{7+9+11} = \ldots = \frac{1+3+5+\ldots+(2n-1)}{(2n+1)\ldots(4n-1)}
\]

2) Prove that any positive decimal number can be represented uniquely using base 3 representation.