

**PROPOSED PROBLEM TO CRUX MATHEMATICORUM WITH
MATHEMATICAL MAYHEM**

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Let $f : [0, 1] \rightarrow \mathbb{R}$ be an integrable function which is continuous at 1. Let $k \in \mathbb{N}$ be a

fixed natural number and let $a_n = \int_0^1 \frac{f(x)}{(1+x^n)(1+x^{n+k})} dx$. Find

1) $L = \lim_{n \rightarrow \infty} a_n$.

2) $\lim_{n \rightarrow \infty} n(L - a_n)$.

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