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Department of Mathematics

Solve It

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For a given natural number $n > 1$, $f_n(x) : [0,1] \to [0,1]$ is defined by

$$f_n(x) = \begin{cases} -n(n+1)x + n + 1, & \text{if } \frac{1}{n+1} \leq x \leq \frac{1}{n}, \\ n(n-1) - n + 1, & \text{if } \frac{1}{n} \leq x \leq \frac{1}{n-1}, \\ 1, & \text{if } x \notin (\frac{1}{n+1}, \frac{1}{n-1}). \end{cases}$$

Is $f_n(x)$ uniformly convergent on $[0,1]$. Explain.