

Let  $f(x) = \frac{\sin x}{x}$ , for  $x > 0$ , and let  $n$  be a positive integer. Prove that  $|f^{(n)}(x)| < \frac{1}{n+1}$ , where  $f^{(n)}$  denotes the  $n^{th}$  derivative of  $f$ .