MAC 2312 - Practice Quiz 5 **Name:**

For full credit, you must <u>show all work</u> and <u>circle</u> the correct answer.

$\boxed{1}$ (*3 pts*) Let $f(x) = \sum_{n=0}^{\infty} \frac{\sin(n)}{n+1}(x - \frac{\pi}{2})^{n+1}$. Show that f has a local minimum at $x = \frac{\pi}{2}$.
Find $f'(\frac{\pi}{2})$ *and find* $f''(\frac{\pi}{2})$.

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(*2pts*) Let $C(t) = (\cos^2 t + \cos t, \sin t \cos t + \sin t)$. Determine whether $C(t)$ has a horizontal tangent line, vertical tangent line, or neither a horizontal tangent line nor a vertical tangent line at $t = \pi$.