

2. Let $f(x) = \begin{cases} \frac{\sin 2x}{x} & x < 0 \\ x^2 + 2 & x \geq 0 \end{cases}$. Is f continuous at $x = 0$? *Explain your answer.* (5 points)

3. Find the derivatives of the following functions. Do *not* simplify answers. (6 points each)

$$f(x) = x^\pi + \pi^x + e^2$$

A.

$$f'(x) =$$

$$y = \sqrt{x^3 + 1} \sin 3x$$

B.

$$y' =$$

$$f(x) = \frac{x + \operatorname{sech}\left(x^{\frac{5}{3}}\right)}{3 \ln x - 2}$$

C.

$$f'(x) =$$