Each problem is worth 5 points. For full credit indicate clearly how you reached your answer.

1. If \( y = x^3 \cos x \), find \( y' \).

   \[
   y' = 3x^2 \cos x + x^3 \sin x
   \]

   \[
   y' = 3x^2 \cos x - x^3 \sin x
   \]

   **Product Rule**

   \[
   f(x) = x^3 \\
   f'(x) = 3x^2 \\
   g(x) = \cos x \\
   g'(x) = -\sin x
   \]

   \[
   f'(x)g(x) = 3x^2 \cos x \\
   f(x)g'(x) = x^3 (-\sin x)
   \]

   \[
   f'(x)g(x) + f(x)g'(x) = 3x^2 \cos x + x^3 (-\sin x)
   \]

2. If \( f(x) = \sqrt{x^2 + 1} \), find \( f'(x) \).

   \[
   f(x) = (x^2 + 1)^{\frac{1}{2}}
   \]

   \[
   f'(x) = \frac{1}{2} (x^2 + 1)^{-\frac{1}{2}} (2x)
   \]

   \[
   f'(x) = \frac{1}{2} \cdot \frac{2x}{(x^2 + 1)^{\frac{1}{2}}}
   \]

   \[
   f'(x) = \frac{x}{\sqrt{x^2 + 1}}
   \]

   To find this derivative put in expanded form then use chain rule.