1. Let \( f(x) = x^{3/4} \).
   (a) Find the equation of the tangent line of \( y = f(x) \) at the point \((81, 27)\).
   
   (b) Use linear approximation to approximate the value of \( 80^{3/4} \).

2. Consider the function
   
   \[
   f(x) = \begin{cases} 
   \frac{3x^2 + 8x + 4}{x+2}, & \text{if } x < -2; \\
   \frac{x^2 - 4}{x+2}, & \text{if } x > -2. 
   \end{cases}
   \]

   (a) Find the limit from the right and the limit from the left of \( f(x) \) as \( x \) approaches \(-2\).

   (b) Is it possible to define \( f(-2) \) so that \( f \) is continuous at \( x = -2 \)? Explain.
3. Let \( f(x) = \frac{x^3}{x^2 - 1} \). Please carefully sketch the graph of \( y = f(x) \). In so doing, please identify and label the open intervals of increasing and decreasing, the local extrema, the open intervals of concave up and down, and the horizontal or vertical asymptotes.