Show all work clearly. If a question asks for an explanation, justify your answers using clear logic and complete sentences. You have 40 minutes to take this 10 point quiz. Good luck!

1. (2 points) True or false: when \( \lim_{x \to a^+} f(x) \) exists, it always equals \( f(a) \). Explain.

   \[
   \text{False. The function need not be continuous. For example, if it had the graph } \quad \frac{1}{x}.
   \]

2. (3 points) Evaluate the following limit: \( \lim_{x \to 1} (2x^3 - 3x^2 + 4x + 5) \).

   \[
   \lim_{x \to 1} (2x^3 - 3x^2 + 4x + 5) = 2 - 3 + 4 + 5 = 8
   \]

   by evaluating the continuous function at \( x = 1 \).

3. (3 points) Evaluate the following limit: \( \lim_{x \to 1} \frac{x^2 - 1}{x - 1} \).

   \[
   \lim_{x \to 1} \frac{x^2 - 1}{x - 1} = \lim_{x \to 1} \frac{(x+1)(x-1)}{x-1} = \lim_{x \to 1} x+1 = 2
   \]

4. (2 points) Evaluate the following limit: \( \lim_{x \to 9} \frac{\sqrt{x} - 3}{x - 9} \).

   \[
   \lim_{x \to 9} \frac{\sqrt{x} - 3}{x - 9} = \lim_{x \to 9} \left( \frac{\sqrt{x} - 3}{x - 9} \cdot \frac{\sqrt{x} + 3}{\sqrt{x} + 3} \right)
   \]

   \[
   = \lim_{x \to 9} \frac{\sqrt{x} - 3}{\sqrt{x} + 3} \cdot \lim_{x \to 9} \frac{x - 9}{(x-9)(\sqrt{x} + 3)}
   \]

   \[
   = \lim_{x \to 9} \frac{1}{\sqrt{x} + 3} = \frac{1}{6}
   \]