Math 131 - Assignment 1

Name _____

January 17, 2024

Score _____

Show all work to receive full credit. Supply explanations when necessary. This assignment is due January 24.

1. Use a table of numerical values to estimate the limit. Your table must show function values at six or more points.
$$\lim_{x \to 0} \frac{7^x - 1}{x}$$

2. Use a table of numerical values to estimate the limit. Your table must show function values at six or more points.
$$\lim_{x \to 1} \frac{|1 - x^2|}{x - 1}$$

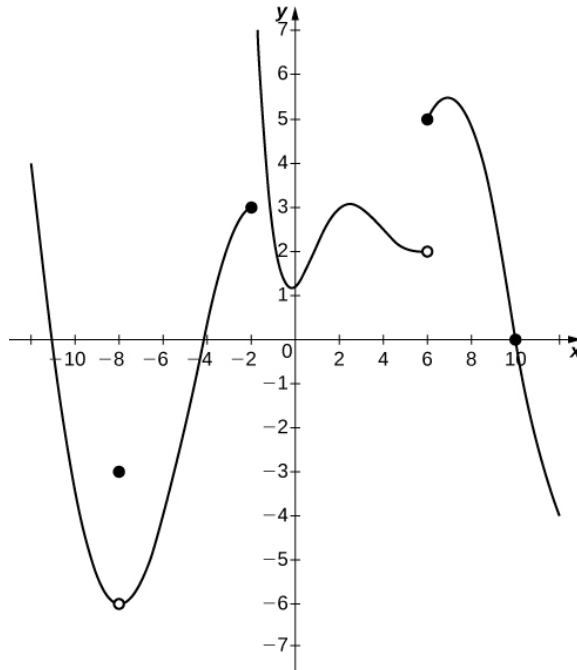3. Use a table of numerical values to estimate the limit. Your table must show function values at six or more points.
$$\lim_{x \to 5} \frac{x + 3}{(x - 5)^2}$$

4. In your own words, describe the meaning of the statement $\lim_{x \to -3} f(x) = 9$.

5. Carefully explain why the limit does not exist: $\lim_{x \to 0} x \ln x$.

6. Referring to the graph of $y = f(x)$ shown below, determine each of the following or explain why it does not exist.

(a) $\lim\limits_{x \to -8} f(x)$

(b) $f(6)$

(c) $\lim\limits_{x \to 0} f(x)$

(d) $\lim\limits_{x \to 6} f(x)$

7. Find the limit analytically by using limit laws. Show all steps.

$$\lim_{x \to 3} 2x(x + 4)$$

8. Suppose $\lim\limits_{x \to 5} f(x) = 4$ and $\lim\limits_{x \to 5} g(x) = 11$. Use limit laws to find the limit below. Show all steps.

$$\lim_{x \to 5} \left[\frac{x\, f(x)}{7\, g(x)} \right]$$