Math 131 - Assignment 2

Name _____

January 24, 2024

Score _____

Show all work to receive full credit. Supply explanations when necessary. This assignment is due January 31.

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1. Find the limit analytically: $\lim_{x \to -5} \left(\dfrac{x^2 + 3x - 10}{x^3 + 11x^2 + 30x} \right)$

2. Find the limit analytically: $\lim_{x \to 1} \dfrac{\sqrt{x+3} - 2}{x - 1}$

3. Find the limit analytically: $\lim_{w \to 0} \dfrac{(w+6)^2 - 36}{w}$

4. Find the limit analytically: $\lim_{x \to 4} \dfrac{\frac{1}{2} - \frac{1}{x-2}}{x - 4}$

5. Explain why direct substitution cannot be used to evaluate the limit: $\lim_{x \to 1} \sqrt{1 - x^2}$

Turn over.

6. Find the limit analytically: $\lim_{y\to 0} \dfrac{\tan(6y)}{3y}$

7. Find the limit analytically: $\lim_{t\to 3^-} \dfrac{t^2-t-6}{|t-3|}$

8. Determine the value of the constant k so that $\lim_{x\to 4} g(x)$ exists.

$$g(x) = \begin{cases} kx + \sin(\pi x), & x \le 4 \\ x\cos(\pi x) - x^2, & x > 4 \end{cases}$$

9. Find the limit analytically: $\lim_{x\to -2^+} (5x^2 - 10x + 13)$

10. Give an example of a one-sided limit that does not exist and say why.