Math 131 - Quiz 2

Name _____

August 27, 2025

Score _____

Show all work to receive credit. Supply explanations where necessary. Partial credit may be awarded on multiple choice problems for correct work or explanations.

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1. (3 points) Find the exact value (not a decimal approximation) of each limit.

   (a) $\lim_{x \to -2} (4x^2 - 5x + 7)$

   (b) $\lim_{x \to \pi/3} (\sqrt{3x} \sin x)$

2. (4 points) Suppose that you are given the following information:

$$f(3) = 8, \qquad \lim_{x \to 3} f(x) = -5, \qquad g(3) = 0, \qquad \lim_{x \to 3} g(x) = 4.$$

   Find each limit. Carefully show how you are using the limit laws.

   (a) $\lim_{x \to 3} [6f(x) - 2g(x)]$

   (b) $\lim_{x \to 3} \left(\dfrac{x^2 f(x)}{g(x)} \right)$

3. (3 points) Explain why neither the limit laws nor direct substitution can be used to evaluate each limit.

   (a) $\lim_{x \to \pi/2} \left(\dfrac{\tan x}{\sin x} \right)$

   (b) $\lim_{x \to 1} \sqrt{1 - x^2}$

   (c) $\lim_{x \to 0} \left(\dfrac{\sqrt[3]{x}}{\sin x} \right)$