

Quiz #0 (Diagnostic Quiz), 1/10
Math 157 (Calculus II), Spring 2024

This quiz is designed to check your knowledge of Calculus I material. It will not be graded.

1. Let $f(x) = \frac{2x-2}{x^2-1}$. Compute the following limits:

$$(a) \lim_{x \rightarrow 1} f(x) \quad (b) \lim_{x \rightarrow 0} f(x) \quad (c) \lim_{x \rightarrow -1} f(x)$$

2. Compute the following derivatives:

$$(a) \frac{d}{dx}(2x^3 + 3x^2 - 3x + 7) \quad (b) \frac{d}{dx}(\sin(x^2)) \quad (c) \frac{d}{dx}(xe^x) \quad (d) \frac{d^2}{dx^2}(xe^x)$$

3. Find the slope of the tangent to the curve $y = \sin(x^2)$ at the point $(x, y) = (0, 0)$.
4. Consider the function $f(x) = x^2 - x + 1$ defined on the closed interval $[0, 1]$. Find the location and values of the minimum and maximum of $f(x)$ on this interval.
5. Compute the following definite integrals:

$$(a) \int_0^1 x^3 + 2x + \sqrt{x} \, dx \quad (b) \int_1^e \frac{2}{x} \, dx$$

6. Compute the following indefinite integrals using the u -substitution technique:

$$(a) \int x\sqrt{x^2+1} \, dx \quad (b) \int \frac{\cos(x)}{\sin(x)} \, dx$$