

Quiz 6 Outline

Format. This quiz has **1 multiple-choice** question, **1 short-answer** question, and **1 free-response** question.

1. (2 points) Use the chain rule to find the derivative of a function. This will involve trigonometric derivatives.

Example: If $f(x) = \sin(\cos(x))$, compute $f'(x)$.

- (a) $f'(x) = \cos^2(x) - \sin^2(x)$
- (b) $f'(x) = \sin(x) \cos(\cos(x))$
- (c) $f'(x) = \cos(x) \cos(\cos(x))$
- (d) $f'(x) = -\sin(x) \cos(\cos(x))$
- (e) $f'(x) = \cos(\cos(x))$

2. (3 points) Use the chain rule (more than once) to compute the derivative of a function.

Example: Compute $\frac{d}{dx} (e^{\sin(\sqrt{x})})$.

Answer:

3. (5 points) Given a curve, use implicit differentiation to find $\frac{dy}{dx}$ and the equation of the tangent line at a given point.

Example: Consider the curve defined by $y = x \sin(y)$.

- (a) (3 points) Use implicit differentiation to compute $\frac{dy}{dx}$.

- (b) (2 points) Find the equation of the tangent line to the curve at the point $(\frac{\pi}{2}, \frac{\pi}{2})$.