MAT 1500 (Dr. Fuentes) **Worksheet 5 - Sections 3.2, 3.3, & 3.4**

Section 3.2: The Product and Quotient Rules

Problem 1. Find $f'(x)$ and $f''(x)$ for $f(x) = \sqrt{x}e^x$.

Problem 2. Find the derivative of $y = \frac{x^2e^x}{x^2+e^x}$.

Problem 3. Let $y = \frac{t}{x^2} + \frac{x}{t}$. (a) Find dy/dx. (b) Find dy/dt.

Section 3.3: Derivatives of Trigonometric Functions

Problem 4. Find the derivative of

$$(a)\ \ g(x) = \sec(x) \qquad\qquad (b)\ \ f(\theta) = \frac{\theta \cdot \sin(\theta)}{\sec(\theta)}$$

Section 3.4: The Chain Rule

Problem 5. Find the derivative of

$$(a)\ \ f(x) = (4x+5)^3(x^2-2x+5)^4 \qquad (b)\ \ g(z) = e^{z/(z-1)} \qquad (c)\ \ h(t) = \tan(\sqrt{1+t^2})$$