MTH 1001 Name:

Quiz 2 Section:

1. **(7 pts)** For $f(x) = \frac{x^2+3e^x}{2e^x-x}$, find $f'(x)$.

2. **(8 pts)** Assume that functions f and g are differentiable with $f(1) = 2$, $f'(1) = -3$, $g(1) = 4$, and $g'(1) = -2$. Find the equation of the line tangent to the graph of $F(x) = f(x)g(x)$ at $x = 1$.

3. **(12 pts)** Particle motion At time t, the position of a body moving along the s-axis is $s(t) = t^3 - 6t^2 + 9t$ m.

a. Find the body's acceleration each time the velocity is zero.

b. Find the body's speed each time the acceleration is zero.

c. Find the total distance traveled by the body from $t = 0$ to $t = 2$.

4. **(6 pts)** For $s(t) = \frac{\sin t}{1-\cos s}$ find ds/dt

5. **(7 pts)** For $y = e^{x^2} + 5x$ find y' and y''.

6. **(10 pts)** Find the tangent line to

$$y = \left(\frac{x-1}{x+1}\right)^2$$

at $x = 0$.