NAME: _____ **Panther ID:** _____

Quiz 0 MAP 2302 - Summer B 2019

To receive credit you MUST SHOW ALL YOUR WORK.

1. (4 pts) Compute $\frac{dy}{dx}$ in each case:

(a) $y = x^2 e^{3x}$

(b) $y = \ln(\sin(\sqrt{x}))$

2. (4 pts) Compute each anti-derivative:

(a) $\int \frac{\cos x}{2 + \sin x}\, dx$

(b) $\int \frac{1 - x}{1 + x^2}\, dx$

3. (3 pts) Newton's Law of Cooling states that the rate of change of the temperature of a cooling body is proportional to the difference between the temperature of the body and the constant temperature of the surrounding medium. A potato that has been baking at 450°F is taken out of the oven and is left to cool down in a room with (constant) temperature of 65°F. Let $y(t)$ be the temperature of the potato t minutes after it was taken out of the oven. Set up a differential equation for $y(t)$ according to Newton's Law of Cooling. You do not have to solve the equation.