1. Compute a formula for the derivative $f'$ of the function $f$ given by $f(x) = 2 \csc^3(39x + 4)$. Simplify your answer as much as reasonably possible.

2. Assume the equation $\sqrt{x + y} = 1 + x^2y^2$ defines $y$ as a differentiable function of $x$ and find $y'$ by implicit differentiation. Show your work.

3. Compute a formula for the inverse of the function $f$ given by $f(x) = \frac{4x - 1}{2x + 3}$. You may assume $f$ is 1–1. Express your formula using $x$ as the input variable.