Math 106   Quiz #10   April 16, 2018

• This is a closed-book quiz. No books, notes, calculators, cell phones, communication devices of any sort, or webpages, or other aids are permitted.

1. [5 points] Compute the derivative for $y = \ln \left(\dfrac{x^{\frac{3}{4}} \sqrt{\sec(4x)}}{(\cos x + \sin x)^6 \; e^{\sqrt{3x+1}}} \right).$

Do not simplify the final answer.

2. [5 points] Compute the derivative $\dfrac{dy}{dx}$ when $x^2 e^y = x \ln y + \ln(e^9 + 1)$.

3. [5 points] Find the function $f(x)$ that satsifies $f'(x) = \dfrac{e^{2x} - e^{-2x}}{e^{2x} + e^{-2x}}$ and $f(0) = 5$.

4. [5 points] Compute $\displaystyle\int_0^{\ln 2} (e^x - e^{-2x})^2 \, dx.$ Simplify.

5. [5 points] Compute $\displaystyle\int_{e^5}^{e^{10}} \frac{1}{x\sqrt{(\ln x) - 1}}\, dx.$ Simplify.

6. [5 points] Compute $\displaystyle\int_0^{\frac{\pi}{6}} \tan x \, dx.$ Simplify.