

## Math 106 Take-Home Quiz #5

Due Sunday, April 23, 2023 in Gradescope by 11:59 pm ET

Instructions:

- This is an Open Notes Quiz. You can use materials, homeworks problems, lecture notes, etc. that you manually worked on.
- This is **NOT** an Open Internet Quiz. You can only access our Main Course Webpage.
- You are not allowed to work on or discuss these problems with other students, professor, Math Fellow TA or simply put anyone.
- You can ask a few small, clarifying, questions in Office Hours, but the problems will not be solved for you.
- The main goal is to make a thoughtful and detailed presentation for the solutions. Submit a clear final draft. No mess please.
- Please submit your final work in Gradescope in the Quiz 5 entry.

1. [10 points] Compute the following Definite Integral.

$$\text{Show that } \int_{e^3}^{e^8} \frac{8}{x\sqrt{1+\ln x}} dx = \boxed{16}$$

2. [10 points] Compute the following Definite Integral.

$$\text{Show that } \int_0^{\ln 3} \frac{1}{e^x(4-e^{-x})} dx = \boxed{\ln\left(\frac{11}{9}\right)}$$

3. [10 points] Use Logarithmic Differentiation to compute the derivative of  $y = x^{\cos x}$ .

4. [10 points] Compute  $\frac{d}{dx} \ln\left(\frac{\sqrt{9-x^5} \cdot e^{\sec x}}{(\ln x) \cdot (x^6 + 7x)^8}\right)$  Use Log Algebra to simplify first.

**DO NOT SPEAK TO ANYONE ELSE ABOUT THIS QUIZ**