

## Math 121 Take-Home Quiz #2

Due Sunday, February 12, 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 2 entry.

Note: Yes! You can use the  $a$ -rules for free for any problem here

1. [10 Points] Show that  $\int_4^{4\sqrt{3}} \frac{1}{\sqrt{64-x^2}} + \frac{1}{16+x^2} dx = \boxed{\frac{3\pi}{16}}$

2. [10 Points] Show that  $\int_0^{\frac{1}{2}\ln\sqrt{3}} \frac{e^{2x}}{1+e^{4x}} dx \stackrel{\text{hint}}{=} \int_0^{\frac{1}{2}\ln\sqrt{3}} \frac{e^{2x}}{1+(e^{2x})^2} dx = \boxed{\frac{\pi}{24}}$

3. [10 Points] Compute  $\int \frac{x^2}{x^2+9} dx$

4. [10 Points] Show that  $\int_1^e \frac{1}{x\sqrt{4-(\ln x)^2}} dx = \boxed{\frac{\pi}{6}}$

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