

Math 121 Take-Home Quiz #2

Due Sunday, September 18, 2022 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.

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

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

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 $\int \frac{x^2}{x^2+9} dx$

Note: If you need the a -rules later in the problem, yes, you can use them for free here**DO NOT SPEAK TO ANYONE ELSE ABOUT THIS QUIZ**