

Due Sunday, March 26, 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 4 entry.

1. [10 points] Evaluate $\int_1^4 x^2 - 3x \, dx$ using the *Limit Definition of the Definite Integral*. Then draw a sketch of the bounded region and explain why the answer is negative.

2. [25 points] Evaluate each of the following Definite Integrals.

$$(a) \int_1^4 x^2 - 3x \, dx = \boxed{-\frac{3}{2}} \quad (b) \int_{-7}^7 7 \, dx = \boxed{98} \quad (c) \int_1^4 \frac{1+x}{\sqrt{x}} \, dx = \boxed{\frac{20}{3}}$$

$$(d) \int_{\frac{\pi}{6}}^{\pi} \sin \theta \, d\theta = \boxed{\frac{2 + \sqrt{3}}{2}} \quad (e) \int_1^2 \frac{(1+x)^2}{x^4} \, dx = \boxed{\frac{37}{24}}$$

3. [15 points] Evaluate each of the following Integrals using u -substitution.

$$(a) \int \frac{x^6}{\sqrt{x^7 + 5}} \, dx \quad (b) \int \frac{\sec^2 x}{(1 + \tan x)^{\frac{9}{7}}} \, dx \quad (c) \int_1^2 \frac{1}{x^2 \left(3 + \frac{1}{x}\right)^2} \, dx = \boxed{\frac{1}{28}}$$

DO NOT SPEAK TO ANYONE ELSE ABOUT THIS QUIZ