Due Sunday, February 19, 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 3 entry.

1. [30 points] Compute the most general antiderivative for each of the following functions.

(a) $\displaystyle \int 4x^7 + \frac{7}{x^4} + x^{\frac{4}{7}} + \frac{1}{x^{\frac{7}{4}}} - \frac{4}{7x^{\frac{4}{7}}} - \frac{7}{4} + \frac{7}{4}x + \frac{1}{7x^7} - \frac{7}{4x^7} \, dx$

(b) $\displaystyle \int (x+1)(x+2) \, dx$

(c) $\displaystyle \int \frac{\left(x^2 + \dfrac{1}{x}\right)\left(x + \dfrac{1}{x^2}\right)}{\sqrt{x}} \, dx$

(d) $\displaystyle \int \sec^2 x + 2\sin x - \cos x - \sec x \tan x \, dx$

(e) $\displaystyle \int \left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)(1+x) \, dx$

2. [10 points] Consider a function f with $f''(x) = -3 + 12x - 12x^2$ and that satisfies $f'(1) = -4$ and $f(0) = 4$.

(a) Find $f(x)$.   (b) Compute $f(1)$. Simplify.

3. [10 points] Consider a function f with $f'(x) = \sec^2 x - 4\sin x$ and that satisfies $f(\pi) = -6$.

(a) Find $f(x)$.   (b) Compute $f\left(\dfrac{\pi}{3}\right)$. Simplify.

DO NOT SPEAK TO ANYONE ELSE ABOUT THIS QUIZ