

Due Sunday, February 2, 2025 in Gradescope by 11:59 pm

Instructions:

- This is an Open Notes Quiz. You can use materials, homeworks problems, lecture notes, etc. that you manually worked on. **NO** Calculators.
- 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. I can tell you if you're on the right track.
- 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 1 entry.

1. [10 Points] Consider $f(x) = 4x^3 - 3x^4 - \frac{3}{4} + \frac{4}{x^3} - \frac{3}{x^4} - 3x - x^{\frac{4}{3}} + x^{\frac{3}{4}} + \frac{1}{x^{\frac{3}{4}}}$

COMPUTE the Derivative $f'(x)$.

2. [10 Points] Consider $f(x) = \left(\sqrt{x} + \frac{1}{\sqrt{x}}\right) \left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)$

SHOW the Derivative $f'(x) = \boxed{1 - \frac{1}{x^2}}$

3. [10 Points] Consider $f(x) = \frac{x^3 - 7x}{5 - 4x^2}$

SHOW the Derivative $f'(x) = \boxed{\frac{-4x^4 - 13x^2 - 35}{(5 - 4x^2)^2}}$

4. [10 Points] Consider $f(x) = \sqrt{5x^4 - 7 - \frac{1}{x^3}}$ COMPUTE the Derivative $f'(x)$.

5. [10 Points] Compute the value of $\cos\left(\frac{4\pi}{3}\right)$ **and** the value of $\sin\left(\frac{4\pi}{3}\right)$ Justify.

Show your work using the Unit Circle/Trig Triangles. *Do not just copy down a value.*

DO NOT SPEAK TO ANYONE ELSE ABOUT THIS QUIZ