Math 252: Quiz 1 **Fall 2025**

Name: _____ **/ 24**

24 points possible; each part is worth 2 points. No aids (book, notes, calculator, phone, etc.) are permitted. Show all work and use proper notation for full credit. Answers should be in reasonably-simplified form.

1. [12 points] Compute the derivatives of the following functions.

a. $f(x) = \cos(ax^2 + b)$ for fixed constants b and c

b. $f(\theta) = \arcsin(\theta) - 2^\theta + \dfrac{1}{e}$

c. $H(t) = t^{2.4} \ln(2t + 1)$

d. $f(x) = 5e^{x/2} + \sin^2(x)$

e. $h(x) = \dfrac{x + \sin(x)}{x + \pi}$

f. $h(x) = \dfrac{1}{5x} + \dfrac{\sqrt{x}}{10}$

2. [12 points] Compute the following antiderivatives (indefinite integrals) and definite integrals. Remember that antiderivatives need a "$+C$".

a. $\displaystyle\int \sin(2x) + \sqrt{x}\, dx$

b. $\displaystyle\int (6x-5)^{(1/4)}\, dx$

c. $\displaystyle\int \frac{\sec^2(x)}{\tan(x)}\, dx$

d. $\displaystyle\int \frac{2x^3+x^2-12}{x^2}\,dx$

e. $\displaystyle\int_{-1}^{0} \frac{x}{(2+x)^2}\,dx$

f. $\displaystyle\int \frac{e^t}{1+e^{(2t)}}\,dt$