

Name: _____

_____ / 24

30 minutes maximum. 24 points possible; each part is worth 2 points. No aids (book, calculator, 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. $f(x) = \frac{e^x}{x^3}$

b. $f(x) = (\ln(x^2 + e^2))^5$

c. $f(x) = a^{\sin(x)}$ where a is a constant, $a > 1$

Math 252: Quiz 1

13 January, 2022

d. $f(x) = \sec\left(\frac{x}{x+1}\right)$

e. $f(x) = e^{\pi x+1} + \sqrt{3}\tan(\pi x)$

f. Find $\frac{dy}{dx}$ if $2x + y = \cos(xy)$. (You must solve for $\frac{dy}{dx}$.)

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

a. $\int_1^2 \frac{2+x^3}{x^2} dx$

b. $\int \frac{e^{3x}}{\sqrt{5+e^{3x}}} dx$

c. $\int \frac{1}{x} + \sec(x) \tan(x) dx$

Math 252: Quiz 1

13 January, 2022

d. $\int x\sqrt{2-x} dx$

e. $\int_0^2 e^x \cos(1+e^x) dx$

f. $\int \tan(x) \sec^2(x) dx$