Math 252: Quiz 1

1 September, 2022

Name: _____

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30 minutes maximum. 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.
$$f(x) = e^2 x^{1/2} + 2e^x + \sqrt{9}$$

b.
$$f(x) = \ln(\cos(x^3) - 4x^7)$$

c.
$$h(x) = \sin(kx^2 - 5)$$
 where k is a constant

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$$\mathbf{d.} \ f(x) = \sec\left(xe^x\right)$$

$$e. \ y = \frac{\cos(2x)}{x^5 + \pi}$$

f. Find
$$\frac{dy}{dx}$$
 if $e^y \cos(x) = xy + 1$. You must solve for $\frac{dy}{dx}$.

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

$$\mathbf{a.} \int \frac{(1+x)^2}{2x} \, dx$$

b.
$$\int (x-1) e^{((x-1)^2)} dx$$

c.
$$\int_0^{\pi} 5e^x + 3\sin(x) dx$$

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$$\mathbf{d.} \int x\sqrt{x+5} \, dx$$

$$e. \int \frac{\cos(\ln x)}{x} \, dx$$

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