

## Homework #16

Due Friday April 7th in Gradescope by 11:59 pm ET

**Goal:** Solidify early Exponentials

1. Sketch and label the graph of  $f(x) = e^x$ . Write the Domain and Range.

2(a) Write the Derivative formula for  $f(x) = e^x$ . That is,  $\frac{d}{dx}e^x = ???$

2(b) Write the Chain Rule for  $f(x) = e^{u(x)}$ . That is,  $\frac{d}{dx}e^{u(x)} = ???$

Differentiate each of the following functions.

3.  $y = e^x$

4.  $y = e^5$

5.  $y = e^{2x}$

6.  $y = (x^3 + 2x) \cdot e^x$

7.  $f(x) = \frac{e^x}{1 - e^x}$

8.  $f(x) = e^{-2x} \cdot \cos x$

9.  $y = \frac{1}{e^x}$

10.  $y = e^{3x} + \frac{1}{e^{3x}}$

11.  $y = e^{\sqrt{x}}$

12.  $f(x) = e^{\sin x}$

13.  $f(x) = \sin(e^x)$

14.  $f(x) = x^2 \cdot e^x$

15.  $f(x) = e^{\tan(4x)}$

16.  $f(x) = \tan(e^{4x})$

17.  $f(x) = \frac{1}{e^{7x}}$

18.  $f(x) = \sqrt{e^x + e^{5x}}$

19.  $f(x) = \frac{1}{\sqrt{x^3 + e^{\cos x}}}$

20. Find the Equation of the Tangent Line to the curve  $f(x) = \frac{1}{\cos x + e^{-8x}}$  at the point where  $x = 0$ .

# REGULAR OFFICE HOURS

**Monday: 12:00–3:00 pm**

**Tuesday: 1:00–4:00 pm**

7:30–9:00 pm TA Ellerman, SMUDD **204**

**Wednesday: 1:00-3:00 pm**

**Thursday: none for Professor**

7:30–9:00 pm TA Ellerman, SMUDD **207**

**Friday: 12:00–2:00 pm**

- Grab a seat in Office Hours, several times a week.