Math 106, Spring 2025

Homework #16

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, $\dfrac{d}{dx}e^x =$???

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

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

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

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

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

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

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

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

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

REGULAR OFFICE HOURS

Monday: 12:00–3:00 pm

7:30–9:00 pm TA Andrew, SMUDD 207

Tuesday: 1:00–4:00 pm

Wednesday: 1:00-3:00 pm

Thursday: none for Professor

8:00–9:30 pm TA Andrew, SMUDD 208A

Friday: 12:00–2:00 pm

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