

Homework #17

Due Wednesday April 9th in Gradescope by 11:59 pm

Goal: Solidify Calculus for Exponentials

Differentiate each of the following

1. $y = e^{-2x} \cos(4x)$ 2. $f(x) = e^{\frac{1}{x}}$ 3. $y = \sin(e^x) + e^{\sin x}$

4. $y = \cos(e^{4x}) + e^{\cos(4x)}$ 5. $f(x) = e^{x^2 \cdot \tan(2x)}$ 6. $y = x^2 \cdot e^{-\frac{1}{x}}$

7. $y = \sqrt{1 + 2e^{3x}}$ 8. $y = e^{(e^x)}$ 9. $f(x) = \frac{e^x - e^{-x}}{e^x + e^{-x}}$

10. Find the Equation of the Tangent Line to $y = \frac{e^x}{x}$ when $x = 2$.

11. Find the Absolute Maximum **Value** of the function $f(x) = x - e^x$.

Compute each of the following Integrals. Simplify if possible.

12. $\int x^e + e^x \, dx$ 13. $\int x^6 e^{x^7} \, dx$ 14. $\int (4 + e^x)^5 e^x \, dx$

15. $\int e^{6x} + \frac{1}{e^{6x}} \, dx$ 16. $\int \frac{e^x}{\sqrt{1 + e^x}} \, dx$ 17. $\int e^{\tan x} \sec^2 x \, dx$

18. $\int (e^x + e^{-x})^2 \, dx$ 19. $\int \frac{\sqrt{1 + e^{-3x}}}{e^{3x}} \, dx$ 20. $\int \frac{e^{\frac{1}{x}}}{x^2} \, dx$

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

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

- To be a beast, train like a beast!