Homework #14

Due Wednesday April 20th in Gradescope by 11:59 pm ET

Goal: Solidify Calculus for Exponentials

Differentiate each of the following

1. $y = e^{-2x}\cos(4x)$
2. $f(x) = e^{\frac{1}{x}}$
3. $y = \sin\left(e^{x}\right) + e^{\sin x}$
4. $y = \cos\left(e^{4x}\right) + e^{\cos(4x)}$
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. $f(x) = \dfrac{e^x - e^{-x}}{e^x + e^{-x}}$
10. Find the Equation of the Tangent Line to $y = \dfrac{e^x}{x}$ 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. $\displaystyle\int x^e + e^x \, dx$
13. $\displaystyle\int x^6 e^{x^7} \, dx$
14. $\displaystyle\int (4 + e^x)^5 e^x \, dx$
15. $\displaystyle\int e^{6x} + \frac{1}{e^{6x}} \, dx$
16. $\displaystyle\int \frac{e^x}{\sqrt{1 + e^x}} \, dx$
17. $\displaystyle\int e^{\tan x} \sec^2 x \, dx$
18. $\displaystyle\int \left(e^x + e^{-x}\right)^2 \, dx$
19. $\displaystyle\int \frac{\sqrt{1 + e^{-3x}}}{e^{3x}} \, dx$
20. $\displaystyle\int \frac{e^{\frac{1}{x}}}{x^2} \, dx$
21. $\displaystyle\int \frac{(1 + e^x)^2}{e^x} \, dx$

REGULAR OFFICE HOURS

Monday: 1:00–3:00 pm

Tuesday: 12:00–4:00 pm

7:30–9:000 pm TA Bobby, SMUDD 205

Wednesday: 1:00-3:00 pm

Thursday: none for Professor

7:30–9:000 pm TA Bobby, SMUDD 205

Friday: 12:00–2:00 pm

- To be a beast, train like a beast!