Math 106, Spring 2022

Worksheet 8, Tuesday, April 12th, 2022

For each of the following 1-2,

- Compute the area of the described bounded region, enclosed by the given curves.
- Sketch the curves and shade the bounded region.

1. $y = 5x - x^2$ and $y = x$, between $x = 0$ and $x = 4$

2. $y = 2 - x^2$ and $y = x^2 - 6$

3. Sketch the graph of the Natural Exponential function $f(x) = e^x$. State the Domain/Range.

4. Compute $\lim_{x\to\infty} e^x =$ $\lim_{x\to-\infty} e^x =$

Compute the derivative $f'(x)$ for each of the following functions $f(x)$. Simplify.

5. $f(x) = e^x$ 6. $f(x) = \dfrac{1}{e^x}$ 7. $f(x) = e^{3x}$ 8. $f(x) = \dfrac{1}{e^{7x}}$

9. $f(x) = e^{\sin x}$ 10. $f(x) = \sin(e^x)$ 11. $f(x) = e^{\sqrt{x}}$ 12. $f(x) = \sqrt{e^x}$

13. $f(x) = e^{(e^x)}$ 14. $f(x) = e$ 15. $f(x) = \dfrac{e}{x}$ 16. $f(x) = \dfrac{x}{e}$

17. $f(x) = e^5$ 18. $f(x) = ex$ 19. $f(x) = \dfrac{1}{ex}$ 20. $f(x) = x^e$

21. $f(x) = \dfrac{1}{x^e}$ 22. $f(x) = \dfrac{e^{-2x}}{1+e^x}$ 23. $f(x) = (e^{2x} - e^{-3x})^7$

24. Suppose $e^{xy} = 2 + \sin x$. Compute $\dfrac{dy}{dx}$

25. Compute $\displaystyle\int e^x\sqrt{1-e^x}\,dx$

Turn in your own solutions.