Math 106, Spring 2018

Worksheet 9, Tuesday, March 27th, 2018

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

2. Compute

$\lim_{x \to \infty} e^x =$

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

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

(a) $f(x) = e^x$

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

(c) $f(x) = e^{3x}$

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

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

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

(g) $f(x) = e^{\sqrt{x}}$

(h) $f(x) = \sqrt{e^x}$

(i) $f(x) = e^{(e^x)}$

(j) $f(x) = e$

(k) $f(x) = \dfrac{e}{x}$

(l) $f(x) = \dfrac{x}{e}$

(m) $f(x) = e^5$

(n) $f(x) = ex$

(o) $f(x) = \dfrac{1}{ex}$

(p) $f(x) = x^e$

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

(r) $f(x) = \dfrac{e^{-2x}}{1+e^x}$

(s) $f(x) = \left(e^{2x} - e^{-3x}\right)^7$

4. Compute the area bounded between $f(x) = e^x$, $y = 0$, between $x = 0$ and $x = 2$. Sketch.

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

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

Turn in your own solutions.