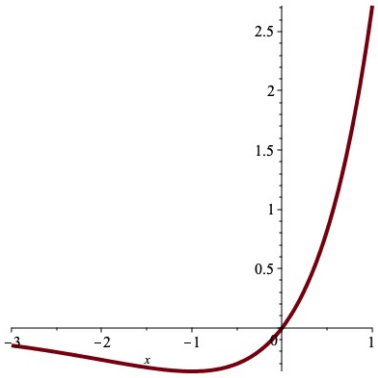
MATH 122: Calculus II
Some Notes on Assignment 9

I: Section 6.3: 37, 47, 54

Exercise 37 : Use Product Rule: $f'(x) = (1+x)e^x$ and $f''(x) = (2+x)e^x$.. There is a relative minimum at $x = -1$ where the value of the function f is $\frac{-1}{e}$. There is a point of inflection on the graph of f at $(-2, f(-2))$



Exercise 37: Graph of xe^x

Exercise 47: (a) Height at age $1 = h(1) = 75.771\,cm$ and rate of growth $= h'(1) = 15.982\,cm/yr$.
(b) $h''(x)$ is negative for all x so rate of growth is always decreasing.

Exercise 54: The maximum revenue would be $\$15000e^{-1} \approx \$5518.19$

II: Section 6.4: 19, 25, 31

Exercise 19: Let $u = 1 + 2\cos x$. Answer is $\frac{-3}{2}\ln|1 + 2\cos x| + C$

Exercise 25: Write the integral as $\int(\cot x^{1/3})x^{-2/3}\,dx$. Note that $\left(x^{1/3}\right)' = \frac{1}{3}x^{-2/3}$. Answer is $3\ln|\sin x^{1/3}| + C$

Exercise 31: $\ln|\csc x - \cot x| + \cos x + C$

III: Section 6.5: 1, 8, 17

Exercise 1: $(\ln 7)7^x$.

Exercise 8:$(-2\ln 3)x3^{2-x^2}$

Exercise 17: $ex^{e-1} + e^x$.