Week 1 in Review

courtesy: David J. Manuel

(covering 151 Review and 5.5)

(Problems with a * beside them will also be done in Python)

1 MATH 151 Review

1. Find $\dfrac{d}{dx}\displaystyle\int_0^{x^2} e^{-t^2}\,dt$.
2. Evaluate $\displaystyle\lim_{x\to\infty} \frac{2}{x\ln(x)}\int_1^x \ln(t)\,dt$
3. For what value(s) of b does $\displaystyle\int_0^b (6x-1)\,dx = 7b$?*
4. Evaluate the following integrals:
   (a) $\displaystyle\int_{-3}^{2} (6-y-y^2)\,dy$*
   (b) $\displaystyle\int_0^1 (2-x)(8x^3)\,dx$
   (c) $\displaystyle\int (\tan\,x)^2\,dx$ (HINT: an identity is helpful here...)
   (d) $\displaystyle\int_{-1}^{1} (2-|x|-x^4)\,dx$

2 Section 5.5

1. Evaluate the following integrals:
   (a) $\displaystyle\int_0^{\ln(5)} \frac{e^x}{1+e^x}\,dx$
   (b) $\displaystyle\int (\sin(\theta))^3\cos(\theta)\,d\theta$
   (c) $\displaystyle\int_0^{\sqrt{3}} \frac{x+1}{x^2+1}\,dx$
   (d) $\displaystyle\int \frac{1}{x(1+(\ln(x))^2}\,dx$
   (e) $\displaystyle\int_0^2 xe^{-x^2}\,dx$
   (f) $\displaystyle\int_0^4 x^3\sqrt{9+x^2}\,dx$*