

Week 5-6 Week in Review

courtesy: David J. Manuel

(covering 7.2, 7.3, 7.4, and 7.8 part 1)

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

1 Section 7.2

1. Evaluate the following integrals:

(a) $\int_0^{\pi/2} \sin^2 x \cos^3 x \, dx$

(b) $\int_0^{\pi/4} \tan^2 x \sec^4 x \, dx$

(c) $\int \cos^4 x \, dx$

2 Section 7.3

1. Evaluate the following integrals:

(a) $\int \sqrt{4-x^2} \, dx$

(b) $\int \frac{1}{\sqrt{x^2-9}} \, dx$

(c) $\int_0^4 x^3 \sqrt{9+x^2} \, dx^*$

3 Section 7.4

1. Evaluate the following integrals:

(a) $\int \frac{4}{(x-1)^2(x+1)} \, dx^*$

(b) $\int \frac{x^3-2}{x^3+x} \, dx$

4 Section 7.8

1. Determine if the following integrals are convergent or divergent, and evaluate if convergent.

(a) $\int_0^{\infty} e^{-5x} dx$

(b) $\int_1^{\infty} \frac{dx}{1+x}$

(c) $\int_1^{\infty} \frac{dx}{1+x^2}$

(d) $\int_1^{\infty} \frac{dx}{x(2x+1)}$

(e) $\int_1^{\infty} \frac{\ln(x)}{x^2} dx^*$