Spring 2019 Math 152

Week in Review 5

courtesy: Amy Austin

(covering section 7.4, 7.8)

Section 7.4

1. $\int \frac{4x+5}{2x^3+5x^2+3x}\,dx$

2. $\int \frac{x^3+2x+1}{x^2+4x}\,dx$

3. $\int_1^2 \frac{dx}{x(x^2+2x+1)}$

4. $\int \frac{3x^2-4x+5}{(x-1)(x^2+1)}\,dx$

5. $\int \frac{x+6}{(x^2+1)(x^2+4)}\,dx$

Section 7.8

6. Determine whether the following improper integrals converge or diverge. If it converges, find the value of the integral. If it diverges, explain why.

   a.) $\int_2^\infty \frac{x}{x^2+1}\,dx$

   b.) $\int_e^\infty \frac{1}{x(\ln x)^4}\,dx$

   c.) $\int_0^\infty xe^{-x}\,dx$

   d.) $\int_{-\infty}^0 \frac{1}{1-2x}\,dx$

   e.) $\int_{-\infty}^\infty \frac{dx}{x^2+9}$

   f.) $\int_{-3}^0 \frac{dx}{(x+3)^2}$

   g.) $\int_0^3 \frac{1}{2x-1}\,dx$

7. Determine whether the following integrals converge or diverge using the comparison theorem:

   a.) $\int_0^\infty \frac{x-1}{x^{10}+e^{5x}}\,dx$

   b.) $\int_2^\infty \frac{x}{x^{3/2}-x-1}\,dx$

   c.) $\int_1^\infty \frac{\cos^2 x}{x^4}\,dx$

   d.) $\int_1^\infty \frac{\sin(4x)+9}{x^2+x+1}\,dx$