

## Fall 2019 Math 152

### Week in Review 4

*courtesy: Amy Austin*

(covering section 7.3-7.8)

### Section 7.3

1.  $\int x^3 \sqrt{4 - x^2} dx$

2.  $\int_{5\sqrt{2}}^{10} \frac{dx}{x^3 \sqrt{x^2 - 25}}$

3.  $\int \frac{dx}{\sqrt{x^2 + 4x + 8}} dx$

4.  $\int_0^{2/3} \frac{1}{(4 + 9x^2)^{5/2}} dx$

### Section 7.4

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

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

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

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

### Section 7.8

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

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

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

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

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

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

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

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