

Week #2 Written Assignment: Due on Wednesday, May 27.

1. Evaluate the integral.

$$\int \frac{x^2}{(3 + 4x - 4x^2)^{3/2}} dx$$

2. Evaluate the integral.

$$\int \frac{2x^3 - 8x^2 - 7x + 9}{(x^2 + x + 1)(x - 2)^2} dx$$

3. Evaluate the integral.

$$\int \frac{\ln x}{x\sqrt{1 + (\ln x)^2}} dx$$

4. We've seen that integrals of the form

$$\int \tan^n(x) \sec^m(x) dx$$

with a substitution when m is even (by factoring out a $\sec^2(x)$ and converting the rest of the secants to tangents) or when n is odd (by factoring out a $\sec(x) \tan(x)$ and converting the rest of the tangents to secants).

- (a) Show that if n is even and m is odd, the integrand can be converted to a rational function by expressing the tangents and secants in terms of sine and cosine and making a substitution.
- (b) Evaluate $\int \tan^2(x) \sec(x) dx$ by using the result of part (a) and integration by partial fractions.