

MATH 3B

Discussion Worksheet - Thursday, May 10

Topics for Midterm 2:

- Volume by Cylindrical Shells:
- Work: See problems done in class (My guess is that pumping water is too long of a problem to put on the midterm)
- Average of a Function:
- Trigonometric Integrals: See Powers of Sines and Cosines handout
- Integration by Parts:

Trigonometric Integrals:

- When do I use Trigonometric Integrals?
- How do I use Trigonometric Substitutions? Refer to the following table:
If you see: Use the substitution: And the Identity:

- Example: Find $\int \frac{1}{x^2\sqrt{x^2+4}} dx$.

Partial Fraction Decomposition:

- When do we use PFD?:
- How do I use the method of PFD?: We know how to compute the following integrals!

$$\int \frac{A}{x+d} dx = \qquad \int \frac{Ax}{x^2+d} dx = \qquad \int \frac{A}{x^2+d} dx =$$

- Strategy: Given a rational function of the form $p(x)/q(x)$

- Example: $\int \frac{x-9}{x^2+3x-10} dx$

- Special Cases Example (Set Up): $\int \frac{x^4+1}{x^5-x^3} dx$