Homework 7

Ungraded Problems

1. §7.2: Problems 1, 9, 11

2. Use a substitution to evaluate 
   \[ \int \cot x \, dx \]
   Do not refer to the table of elementary integrals.

3. Use a very clever substitution to evaluate 
   \[ \int \csc x \, dx \]
   Do not refer to the table of elementary integrals.
   Hint: look at the example of \( \sec x \) in the notes or the book.


5. §7.3: Problems 5, 7, 9.

   Hint: Clean up the quadratic first.

7. §7.4: Problems 1, 3, 5, 7, 15, 21, 35.

Graded Problems

1. §7.2: Problem 22.

2. Rotate the curve \( y = a \sin(\pi x / a), \ 0 \leq x \leq a \) about the \( x \)-axis. The resulting volume is \( 2\pi \).
   What is \( a \)?

3. Compute \( \int_{-\pi}^{\pi} \sin^2 x \cos^4 x \, dx \).
   You are allowed to (and should) make use of Problems 65–67 from Section 7.2.

4. §7.3: Problem 18.

5. §7.4: Problem 14.