**MATH 1073 Calculus I**

**Assignment 8**

1. Use Part 1 of the Fundamental Theorem of Calculus to find the derivative of the function.

2. Evaluate the integral.

3. Sketch the region enclosed by the given curves and calculate its area.

4. Water flows from the bottom of a storage tank at a rate of *r*(*t*) = 200 − 4*t* liters per minute, where 0 ≤ *t* ≤ 50. Find the amount of water that flows from the tank during the first 10 minutes.

5. (Optional) Verify that is an odd function and use that fact to show that

6. If a and b are positive numbers, show that

(*Hint:* *Integration by substitution.*)

7. If f is continuous and , find

8. Evaluate the integrals.

(*Hint: First make a substitution and then use integration by parts to evaluate the integral.*)

9. (Optional) (a) Use the reduction formula in Example 6 to show that

where n ≥ 2 is an integer.

(b) Use part (a) to evaluate and .

(c) Use part (a) to show that, for odd powers of sine,

10. (a) Use integration by parts to prove the reduction formula.

(b) Use part (a) to find .