

College of the Redwoods
Mathematics Department

Math 50B — Integral Calculus
Exam #4

David Arnold

Quiz Questions

Read Carefully! You have until the end of the class period to complete the exam. Place the solution to each exercise on a separate sheet of paper. When finished, arrange your solutions in order, place these exam page(s) on top of your solutions, and staple. Good luck!

Important Notice: You are not allowed to use calculators on this exam. The exam is closed book, closed notes, closed resource book.

EXERCISE 1. Find the following indefinite integral.

$$\int x^2 \sin x \, dx$$

EXERCISE 2. Use trigonometric substitution to find the following indefinite integral.

$$\int \frac{\sqrt{4-x^2}}{x^2} \, dx$$

EXERCISE 3. Use partial fraction decomposition to find the following indefinite integral.

$$\int \frac{dx}{4-3x-x^2}$$

EXERCISE 4. For what values of p does the following definite integral converge? Evaluate the definite integral for those values of p .

$$\int \frac{dx}{x(\ln x)^p}$$

EXERCISE 5. Consider the function

$$f(x) = \frac{x^3}{6} + \frac{1}{2x}.$$

Find the length of the arc on the path defined by this function for $1/2 \leq x \leq 1$.

EXERCISE 6. Consider the function

$$f(x) = \sqrt{4-x^2}.$$

The path on the graph of this function on $-2 \leq x \leq 2$ is revolved around the x -axis. Use integration to find the surface area of the resulting figure.