

## MATH 1952 Practice Midterm Exam 2

Name: \_\_\_\_\_

**Instructions:** This test should have 5 problems, and is out of 100 points. Please answer each question as completely as possible, and show all work unless otherwise indicated. You may use an approved calculator for this exam. (Approved: non-graphing, non-programmable, doesn't take derivatives) Answers do not need to be fully simplified unless otherwise specified in the problem.

1. Find the average value of the function  $f(x) = (\cos x)^3$  between  $x = 0$  and  $x = \frac{\pi}{6}$ .
2. Find the integral  $\int \tan^{-1} x \, dx$ .
3. Find the integral  $\int x^2 \ln x \, dx$ .
4. Find the integral  $\int \frac{\sqrt{x^2-1}}{x} \, dx$ .
5. Use cylindrical shells to find the volume of the solid created by rotating about the y-axis the area under  $f(x) = \frac{-5}{x^2-x-6}$  between  $x = 1$  and  $x = 2$ .