

Math 190 Lab 9: Nov 17 and 19

Work through the following problems while the instructor and TA circulate. When you have completed the problems (to the satisfaction of the facilitators) you can spend the rest of the lab working on the weeks homework.

Warm up: Find the general anti-derivative of

- $f(x) = 0$
- $f(x) = -2$
- $f(x) = 4x$
- $f(x) = x^n$ where $n \neq -1$
- $f(x) = \frac{1}{x}$
- $f(x) = e^x$
- $f(x) = \sin x$
- $f(x) = \cos x$

Questions:

1. Evaluate the following definite integrals

(a) $\int_0^{\pi/3} (2 \sin x + \cos x) dx$

(b) $\int_{-3}^{-1} \frac{x + x^2}{x} dx$

2. (a) Suppose that

$$\int_{-1}^1 f(x) dx = -2$$

and that

$$\int_1^4 f(x) dx = -3.$$

Find

$$\int_{-1}^4 f(x) dx.$$

Explain how you know using a picture.

(b) What is

$$\int_2^2 f(x) dx?$$

Explain how you know using a picture.