

## Math 190 Homework 10: Due Monday November 30

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The assignment is due at the beginning of class on the due date. You are expected to provide full solutions, which are laid out in a linear coherent manner. Your work must be your own and must be self-contained. Your assignment must be stapled with your name and student number at the top of the first page.

### Questions:

1. Compute the following integrals

(a)  $\int \frac{\sin x}{\cos x} dx$

(b)  $\int \sin x e^{\cos x} dx$

2. Find a function  $F(x)$  such that

$$F'(x) = -\sqrt{3} \cos x + 4 \sin 3x$$

and  $F(\pi/3) = 0$ .

3. A function is called *odd* if

$$f(-x) = -f(x)$$

for all values of  $x$ .

(a) Using a picture, explain why you suspect that

$$\int_{-a}^a f(x) dx = 0$$

(b) Prove using a substitution that

$$\int_{-a}^a f(x) dx = 0$$

for any odd function  $f(x)$  and any value of  $a$ .

4. Compute the following definite integral

$$\int_{-2}^2 x e^{x^2} dx.$$

Explain, in reference to Question 3, why you expected this result.

5. Evaluate the following definite integral

$$\int_0^4 \frac{x}{\sqrt{1+2x}} dx.$$