LAST NAME: FIRST NAME:

MATH 65B - Spring 2018

Groupwork 1: January 16, 2018

1. Use the Fundamental Theorem of Calculus to compute the following derivative.

$$\frac{d}{dx}\int_1^{\sin(x)} \cos(t)e^{-t^3}\ dt$$

2. Compute the following indefinite integral.

$$\int \sin(x)\sec^2(\cos(x))\ dx$$

Please, show all work.

3. Compute the following definite integral.

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

4. Compute the following limits.

(a) $\lim_{x\to 0} \dfrac{x}{\cos(x)}$

(b) $\lim_{x\to 1} \dfrac{\ln(x)}{\sin(\pi x)}$

(c) $\lim_{x\to 0^+} x^{x^2}$

(d) $\lim_{x\to\infty} x \tan\left(\dfrac{1}{x}\right)$

Please, show all work.

5. Compute the following indefinite integral.

$$\int \frac{e^x}{1+e^{2x}}\,dx$$

6. Solve the following initial value problem.

$$\frac{dy}{dx} = 1 + y^2, \quad y(0) = 0$$

Please, show all work.