

Math 1A Quiz 6
November 30th, 2007

Name _____ SID _____

1. Let $f(x)$ be a continuous function and a be a fixed positive real number. Define

$$F(x) = \int_a^{x^2} f(t) dt.$$

a) Find $F'(x)$.

b) Suppose G is another function such that

$$G'(x) = F'(x) \quad \text{and} \quad G(\sqrt{a}) = 2.$$

Find $F(x) - G(x)$.

2. Find

$$\int_0^{\sqrt{2}/2} (\sqrt{1-x^2} - x) dx$$

by interpreting the integral as an area.

3. Write a Riemann sum approximating the integral

$$\int_2^4 \sqrt{\cos x} \, dx.$$

Use a partition into intervals of equal length, and use the *right-hand* endpoints of the intervals as your x_i^* 's. You do NOT need to evaluate this integral.

Bonus Point: Let k be a fixed real number. Find all continuous functions f such that $f(x) = \int_0^x kf(t) \, dt$.