

**WRITE YOUR NAME:**

MAC 2311 Homework 6

Due in class, Friday March 31st

You can use more paper if necessary, but please STAPLE

**Question 1.** Find the local linear approximation of the function  $f(x) = \sqrt{x}$  at  $x_0 = 9$ , and use it to estimate  $\sqrt{8}$  and  $\sqrt{10}$ .

**Question 2.** Find the local linear approximation of the function  $f(x) = \sqrt{1+x}$  at  $x_0 = 0$ , and use it to estimate  $\sqrt{0.9}$  and  $\sqrt{1.1}$ .

**Question 3.** Evaluate the limit.

$$\lim_{x \rightarrow 0} \frac{x^2}{\sin x}$$

**Question 4.** Evaluate the limit.

$$\lim_{x \rightarrow 0} \frac{e^x - 1}{\sin x}$$

**Question 5.** Evaluate the limit.

$$\lim_{x \rightarrow 0} \frac{\sin 2x}{\sin 5x}$$

**Question 6.** Evaluate the limit.

$$\lim_{x \rightarrow 0} (1 - 3x)^{1/x}$$