

1. Suppose  $f$  is a function defined in an interval containing  $x = a$ . Negate the following statement:

*For each  $\varepsilon > 0$ , there exists  $\delta > 0$  such that*

$$|f(x) - f(a)| < \varepsilon \text{ whenever } |x - a| < \delta .$$

2. Suppose  $f$  is a function defined near  $x = a$ . Negate the following statement:

There exists an affine function  $L$  given by  $L(x) = m(x - a) + f(a)$  such that

*for each  $\varepsilon > 0$ , there exists  $\delta > 0$  such that*

$$\left| \frac{f(x) - A(x)}{x - a} \right| < \varepsilon \text{ whenever } |x - a| < \delta .$$