Name:

MATH 104, Mini Quiz #1
February 4

You will have 5 minutes for this quiz; it is worth 10 points (equivalent to one-third of a homework assignment). No justification is required, but make sure your answers are clearly marked. Be warned – when things are ambiguous, I always seem to guess the wrong one.

1. **TRUE** **FALSE** If (a_n) is a monotone sequence, then it has a limit.

2. **TRUE** **FALSE** If (a_n) is a monotone sequence, then it must converge.

3. **TRUE** **FALSE** The operator $\limsup a_n$ is defined as

$$\limsup a_n = \sup\{\lim_{N\to\infty} a_N\}.$$

4. **TRUE** **FALSE** The operator $\liminf a_n$ is defined as

$$\liminf a_n = \lim_{N\to\infty} \inf\{|a_N - a_n| : n > N\}.$$

5. **TRUE** **FALSE** A sequence (a_n) of real numbers is called a *Cauchy sequence* if for each $\epsilon > 0$, there exists a real number N such that $m, n > N$ implies $|a_n - a_m| < \epsilon$.