

Problem of the Week-2: Some Facts About Limits

For each of the following statements, determine whether it is True or False. As always, you must justify your answer.

1. If $f(x) < g(x)$ for all $x > 0$ and both $\lim_{x \rightarrow \infty} f(x)$ and $\lim_{x \rightarrow \infty} g(x)$ exist (and finite), then $\lim_{x \rightarrow \infty} f(x) < \lim_{x \rightarrow \infty} g(x)$
2. If $\lim_{x \rightarrow a} f(x)$ exists and finite and $\lim_{x \rightarrow a} g(x)$ does not exist, then $\lim_{x \rightarrow a} (f(x)g(x))$ does not exist.
3. The tangent line to a curve at a certain point that touches the curve at infinitely many other points cannot be a horizontal or slant asymptote to this curve.

Posting Date 9/14/14. Submit solutions to Noah Aydin, Mathematics Department, RBH 319 (e-mail or hard-copy, but hard copy submissions must include a time stamp) by 4 pm on 9/26/14.