1) You will be making comparisons to either geometric series or p-test. The quiz is testing your ability to use the two comparison tests: basic (ct) and limit (lct). If you don’t use one of the two, you’ll lose all points.

2) You’ll need to know a precise statement of the tests. For example, LCT asks $0 < L < \infty$. Some people write it as $0 \leq L \leq \infty$, which is wrong and causes loss of points.

3) If you use L’Hop, you have to actually check the $\frac{0}{0}$ or $\frac{\infty}{\infty}$ – not just say it because all the other problems were OK.

4) If you use L’Hop, you have to change your $n$ to $x$:

$$\lim_{n \to \infty} \frac{\ln(n)}{n} = \lim_{x \to \infty} \frac{[\ln(x)]'}{x} = \lim_{x \to \infty} \frac{1}{x} = 0$$

5) If you use an inequality, you have to check it. In the example below, you would lose points for not showing work:

$$\frac{1}{\sqrt{n^2 + n - 1}} \leq \frac{1}{n}$$

6) A reminder: you can’t compute limits using shortcuts like this:

$$\lim_{n \to \infty} \frac{n^2 - n + 1}{n^3 + n^2 + n} \approx \frac{n^2}{n^3} = \frac{1}{n} \to 0$$

Either do

$$\lim_{n \to \infty} \frac{n^2 - n + 1}{n^3 + n^2 + n} = \lim_{n \to \infty} \frac{\frac{1}{n} - \frac{1}{n^2} + \frac{1}{n^3}}{1 + \frac{1}{n} + \frac{1}{n^2}} \frac{0}{1} = 0$$

or use L’Hospitals rule:

$$\lim_{n \to \infty} \frac{n^2 - n + 1}{n^3 + n^2 + n} = \infty = \lim_{x \to \infty} \frac{2x - 1}{3x^2 + 2x + 1} = \infty = \lim_{x \to \infty} \frac{2}{6x + 2} = 0$$