Tests are an Integral Part of Life (Lecture Assignment)

Complete this assignment and submit it to Gradescope by 4:00pm on your class day. You can print this sheet, or write on your own paper. Contact us if internet connections or other issues require alternate arrangements.

Determine whether the Integral Test applies or not. Then determine whether the series converges or diverges.

1. $\sum_{n=1}^{\infty} \frac{e^{1/n}}{n^2}$

Positive: $\frac{e^{1/n}}{n^2} = \frac{+}{+}$

Decreasing: $\frac{d}{dn}\frac{e^{\frac{1}{n}}}{n^2} = \frac{-(e^{\frac{1}{n}} + 2e^{\frac{1}{n}} n)}{n^4}$

Continuous: $\frac{1}{n^2} : (-\infty, \infty)$

$\int_1^{\infty} \frac{e^{1/n}}{n^2}\, dn$

2. $\sum_{j=2}^{\infty} \frac{1}{j \ln j}$.

P: $j = +$ for $n \geq 2$, $\ln j > +$ for $n \geq 2$

D: $+ \ln j$

C: $\frac{1}{j}$: continuous

$\int_2^{\infty} \frac{1}{j \ln j}\, dj = \ln|\ln j|$

3. $\sum_{k=0}^{\infty} \frac{2k}{(k^2+1)^2}$.

One-Minute Questions: Write a sentence for each.

A. What's one mathematical question you have after watching the videos?

How do sums for polar coords work?

B. What's one interesting thing you learned from the book or videos?

I learned Riemann sums can be used for alot of estimates