

Worksheet #15

Math 231 AD1

Solutions for #9

- a) LCT to $\frac{n^2}{n^{9/2}}$. **Converge**
- b) LCT to $\frac{1}{n^2}$. **Converge**
- c) Ratio Test. **Converge**
- d) Comparison Test to $\frac{1}{3^k}$. **Converge**
- e) LCT to $\frac{1}{k}$. **Diverge**
- f) Check absolute value first: LCT $\frac{2}{k^2}$. **Converge**
- g) Div. (n th-term) Test. **Diverge**
- h) LCT to $\frac{k^{1/3}}{k}$. **Diverge**
- i) Ratio Test. **Converge**
- j) Root Test. **Converge** (Not ratio since $\frac{k^k}{(k+1)^{k+1}}$ doesn't cancel nicely)
Also, you could use Comparison Test to any p-series, say $\frac{1}{10k^2}$
- k) Comparison to $\frac{1}{2^k}$. **Converge**
- l) Ratio Test. **Converge**
- m) Ratio Test. **Converge**
- n) Ratio Test. **Converge**
- o) Div. (n th-term) Test. **Diverge**
- p) LCT to $\frac{1}{k^2}$. **Converge**
- q) LCT to $\frac{1}{k^{3/2}}$. **Converge**
- r) Div. (n th-term) Test. **Diverge**
- s) LCT to $\frac{1}{n}$. **Diverge**
- t) LCT to $\frac{\sqrt{k}}{k}$. **Diverge**
- u) Ratio Test. **Converge**
- v) Ratio Test. **Converge**
- w) Ratio Test. **Converge**
- x) LCT to $\frac{k}{k^3}$. **Converge**
- y) Div. (n th-term) Test. **Diverge**
- z) Telescoping. **Diverge**

Every convergent series was absolutely convergent.

Just by coincidence, there were no conditionally convergent series.