Calc III Notes Day 36

Joseph Brooksbank

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Decide which test should work (and then use that test!) to decide convergence for:

1

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

Do terms approach 0? yes
sign is all positive
Trying ROOT test:
ANSWER: Root test

nth power makes it likely a root test most of the time root and ratio test work interchangibly
Another (awful) possible solution: integral test (but awful)

2

$$\sum_{n=3}^{\infty} \frac{cos(n)^2}{n^2 ln(n)}$$

Solutions: Comparison (cos is always leq than 1)

3

$$\sum_{n=8}^{\infty} \frac{\sqrt{n}+1}{n^2-1}$$

Solution: Limit Comparison Test

4

$$\sum_{n=1}^{\infty} \frac{5^n}{3^n+4^n}$$

5

$$\sum_{n=1}^{\infty} \frac{(-3)^n n^2}{n!}$$

solution: can't use AST (derivative part) because factorial

6

diverges

7

Integral test u = $\frac{1}{x}$
LCT $\frac{1}{n^2}$