MAT 137
Tutorial #18– Convergence Tests
March 20-21, 2017

Determine which ones of the following series are absolutely convergent, conditionally convergent, or divergent.

1. $\displaystyle\sum_{n=1}^{\infty} \frac{e^{1-1/n}}{3+\sin n}$

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

3. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{n}$

4. $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^2}$

5. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{n^2+6}$

6. $\displaystyle\sum_{n=1}^{\infty} \frac{n^2}{\sqrt{n^5+4n+11}}$

7. $\displaystyle\sum_{n=1}^{\infty} (-1)^n \sin\frac{1}{n}$

8. $\displaystyle\sum_{n=1}^{\infty} (-1)^n n \sin\frac{1}{n}$

9. $\displaystyle\sum_{n=1}^{\infty} \frac{(n+3)2^n}{n!}$

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

11. $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^n}$

12. $\displaystyle\sum_{n=1}^{\infty} \frac{2\cdot 4\cdot 6\cdot\ldots\cdot(2n)}{1\cdot 3\cdot 5\cdot\ldots\cdot(2n-1)} \cdot \frac{\pi^{n+1}}{e^{2n-1}}$

13. $\displaystyle\sum_{n=1}^{\infty} \frac{\sin n}{n^2}$

14. $\displaystyle\sum_{n=1}^{\infty} \frac{n!}{10^{4n}}$

15. $\displaystyle\frac{1}{2} + \frac{2}{3^2} - \frac{4}{4^3} + \frac{8}{5^4} + \frac{16}{6^5} - \frac{32}{7^6} + \ldots$

16. $\displaystyle\sum_{n=2}^{\infty} \frac{\cos(n\pi)}{\ln n}$

17. $\displaystyle\sum_{n=2}^{\infty} \frac{1}{n\,(\ln n)^2}$

18. $\displaystyle\sum_{n=2}^{\infty} \frac{1}{\ln n}$

19. $\displaystyle\sum_{n=2}^{\infty} \frac{\ln n}{n^{1.1}}$

20. $\displaystyle\sum_{n=2}^{\infty} \frac{1}{(\ln n)^3}$