



Fun with series(!)

For each series, write out, and add, enough terms so you “get” a feeling for whether or not the series converges. Don’t worry so much about what it converges **to**, but just whether it converges or not. Feel free to use your calculator, a computer, or whatever helps you get a handle on the sizes of the terms, and more importantly, the “partial sums”.

1. $\sum_{n=0}^{\infty} \frac{n}{2n+1}$

4. $\sum_{n=0}^{\infty} \frac{1}{n!}$

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

10. $\sum_{n=0}^{\infty} \frac{(-1)^n \pi^{2n}}{3^{2n} (2n)!}$

13. $\sum_{n=0}^{\infty} \frac{(-1)^n \pi^{2n+1}}{4^{2n+1} (2n+1)!}$

16. $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n}}$

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

5. $\sum_{n=0}^{\infty} \frac{(-1)^n}{2n+1}$

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

11. $\sum_{n=0}^{\infty} \frac{1}{2^n n!}$

14. $\sum_{n=0}^{\infty} \frac{(-1)^n 3^n}{5^n}$

17. $\sum_{n=1}^{\infty} e^{-n}$

3. $\sum_{n=0}^{\infty} \frac{2^n}{3^{n+1}}$

6. $\sum_{n=1}^{\infty} \ln\left(\frac{n}{n+1}\right)$

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

12. $\sum_{n=n=0}^{\infty} \frac{2^n}{n!}$

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

18. $\sum_{n=1}^{\infty} (\arctan(n+1) - \arctan(n))$

Converge or Diverge?:

DCCCCCCCCCCCCDCC