

Homework #19Due **Sunday, May 2nd** in Gradescope by 11:59 pm ET.**Watch:** [Power Series Video #8 on Extra Sums](#)Find the **sum** of each of the following series (which do converge). Simplify.

1. $1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \dots$

2. $\sum_{n=0}^{\infty} \frac{(-1)^n \pi^{2n+1}}{9^n (2n)!}$

3. $-\frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \dots$

4. $-\frac{\pi^3}{3!} + \frac{\pi^5}{5!} - \frac{\pi^7}{7!} + \frac{\pi^9}{9!} - \dots$

5. $-1 + \frac{1}{2} - \frac{1}{3} + \frac{1}{4} - \frac{1}{5} + \frac{1}{6} - \dots$

6. $\sum_{n=0}^{\infty} \frac{(-1)^n (\ln 8)^n}{3^{n+1} n!}$

7. $\sum_{n=0}^{\infty} \frac{(-1)^n \pi^{2n}}{(36)^n (2n+1)!}$

$$8. \frac{1}{6} - \frac{1}{2(6)^2} + \frac{1}{3(6)^3} - \frac{1}{4(6)^4} + \dots$$

$$9. 1 - e + \frac{e^2}{2!} - \frac{e^3}{3!} + \frac{e^4}{4!} - \frac{e^5}{5!} + \dots$$

$$10. -\frac{\pi^2}{2!} + \frac{\pi^4}{4!} - \frac{\pi^6}{6!} + \frac{\pi^8}{8!} - \dots$$

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

$$12. \sum_{n=0}^{\infty} \frac{1}{e^n}$$

$$13. \sum_{n=0}^{\infty} \frac{(-1)^{n+1} 2^{n+1} (\ln 9)^n}{n!}$$

$$14. 4 - \frac{4}{3} + \frac{4}{5} - \frac{4}{7} + \frac{4}{9} - \dots$$

$$15. \sum_{n=0}^{\infty} \frac{e^6 (x-6)^n}{n!} \quad (\text{your answer will be in terms of } x)$$