Worksheet 12

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1. For which values of p is the series

$$\sum_{n=2}^{\infty}(-1)^{n-1}\frac{(\ln\ n)^p}{n}$$

convergent?

2. How many terms of the series $\sum_{n=2}^{\infty}\frac{(-1)^n}{2^n n}$ would you need to add to find its sum to within 0.001?

Determine whether the series is absolutely convergent, conditionally convergent, or divergent.

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

4. $\sum_{n=1}^{\infty}\frac{(-1)^n}{n^4}$.

5. $\sum_{n=1}^{\infty}(-1)^n\frac{n}{\sqrt{n^3+2}}$.

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

7. $\sum_{j=1}^{\infty}(-1)^j\frac{\sqrt{j}}{j+5}$.

Test the series for convergence or divergence

8. $\sum_{n=0}^{\infty}\frac{n!}{2\cdot 5\cdot 8\cdots(3n+2)}$.

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

10. $\sum_{n=1}^{\infty}\tan(1/n)$.

11. $\sum_{n=1}^{\infty}(-1)^n\frac{(n!)^n}{n^{4n}}$.

12. $\sum_{n=1}^{\infty}(\sqrt[n]{3}-1)$.