

You are encouraged to work in groups of two to four on this assignment and make a single group submission. Each problem is worth 5 points. For full credit indicate clearly how you reached your answer. All work must be legible and submitted on clean paper without ragged edges.

1. Determine whether the series $\sum_{n=1}^{\infty} \frac{2}{n^2 + 4n + 3}$ converges or diverges, and if it converges, determine the limit.
2. Determine whether the series $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{\ln n}{n}$ converges or diverges.
3. Determine whether the series $\sum_{n=1}^{\infty} \frac{2^n}{(n+1)!}$ converges or diverges.
4. Determine whether the series $\sum_{n=2}^{\infty} \frac{1}{n^3 \sqrt{\ln n}}$ converges or diverges.
5. Look at #12 in the Chapter 11 Problems Plus section. Show that when the cards are stacked as described there, the total amount by which the cards extend beyond the edge of the table is larger than any real number N .
6. Still looking at #12 in the Chapter 11 Problems Plus section, show that when the cards are stacked this way the center of mass of the pile as each card is added is not off the edge of the table.