1. Find the center of mass of a uniform lamina of density $\rho$, which is bounded by $x = 0$, $x = 1$, $y = 0$ and $y = e^x$.

   **Answer:** \( \left( \frac{1}{e - 1}, \frac{e + 1}{4} \right) \).

2. Determine if the sequence \( \{a_n\} \), where \( a_n = \frac{(-1)^n n^3}{n^3 + 2n^2 + 1} \), converges. If so, find the limit.

   **Answer:** The sequence diverges.

3. Determine if the sequence \( \{b_n\} \), where \( b_n = \frac{\sin(2n)}{1 + \sqrt{n}} \), converges. If so, find the limit.

   **Answer:** The limit is 0.

   **Hint:** Use the Squeeze Theorem.

4. Determine if the series \( \sum_{n=1}^{\infty} \frac{2}{n^2 + 4n + 3} \) converges. If so, find the sum.

   **Answer:** The sum is \( \frac{5}{6} \)

   **Hint:** Use partial fractions.

5. Determine if the series \( \sum_{n=1}^{\infty} [(0.8)^{n-1} - (0.3)^n] \) converges. If so, find the sum.

   **Answer:** The sum is \( \frac{32}{7} \)

6. Find the values of \( x \) for which \( \sum_{n=0}^{\infty} \frac{(x + 3)^n}{2^n} \) converges. For those \( x \), find the sum.

   **Answer:** The sum is \( \frac{2}{-x - 1} \) for \(-5 < x < -1\).