Math 126-Week 2 Homework

Due September 12 in class

Provide thorough written responses to the exercises below. Use complete sentences for your responses, and explain all of your steps in each problem. Make your work neat and presentable (rewrite your solutions from scratch paper if need be). Note: You are free to work with each other, but do not consult any other resources besides your book, your notes, and your professor.

1. Determine whether the following series converge or diverge, and justify your answer with an appropriate test.

   (a)
   $$\sum_{n=0}^{\infty} \frac{3^n + n^2}{2^{2n} + n^3}$$

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

   (c)
   $$\sum_{n=1}^{\infty} \frac{\sqrt[3]{n} - 1}{n\sqrt{n+1}}$$

   (d)
   $$\sum_{n=1}^{\infty} \frac{1 \cdot 3 \cdot 5 \cdots (2n-1)}{2 \cdot 5 \cdot 8 \cdots (3n-1)}$$

2. For which real numbers x can one find a geometric series, with first term 1, whose sum is x?