Series Homework – Day 3

For 1 -2, write the expression for the *n*th term, a_n.

1. $\sum_{n=1}^{\infty} a_n = 1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \cdots$

2. $\sum_{n=1}^{\infty} a_n = 5 + 0.5 + 0.05 + 0.005 + \cdots$

For 3-4, write the first four terms and the general term for the infinite polynomial associated with each function.

3. $f(x) = 1/(1 + x)$

4. $f(t) = 4/(1 + t^2)$

5. Let *S* be the series

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

   a. Find the value to which *S* converges when $x = 3$.

   b. Determine all values of *x* for which *S* converges.

   c. Find all values of *x* that make the sum of the series *S* greater than 20.

6. Given $0.3\overline{14}$.
   a. Write the repeating decimal as a geometric series.

   b. Write its sum as the ratio of two integers.