Do the following series converge or diverge?
If a series converges, find the value to which it converges.

1. $\displaystyle\sum_{k=0}^{\infty} \frac{1}{3^k}$

2. $\displaystyle\sum_{k=0}^{\infty} \frac{3}{(-7)^k}$

3. $\displaystyle\sum_{k=2}^{\infty} \frac{5^k}{2^k}$

4. $\displaystyle\sum_{k=2}^{\infty} \left(\frac{3}{4}\right)^k$

   Notice where k begins!

5. $\displaystyle\sum_{k=42}^{\infty} \frac{1}{5^k}$