**Explicit Sequence Formulas** – Use the explicit formula for $\{a_n\}_{n=1}^{\infty}$ to write the first four terms of each sequence and sketch a graph of the sequence.

**1**. $a_n = \frac{1}{2^n}$

**2**. $a_n = \frac{(-1)^n n}{n^2+1}$

**Working with Sequences** – For the following sequences, find the next two terms of the sequence, find a recurrence relation that generates the sequence, and then find an explicit formula for the $n^{th}$ term of the sequence.

**3**. $\{a_n\} = \{-2, 5, 12, 19, \dots\}$

**4**. $\{b_n\} = \{3, 6, 12, 24, 48, \dots\}$

**Limits of Sequences** – Write and graph the first tour terms of each sequence and conjecture about its limit. If the limit appears to diverge, informally prove that it does indeed diverge.

**5**. $\left\{\frac{(-1)^n}{n^2+1}\right\}_{n=1}^{\infty}$

**6**. $\{\cos \pi n\}_{n=1}^{\infty}$

**7**. $\{a_n\}_{n=1}^{\infty}$ where $a_{n+1} = -2a_n, a_1 = 1$

**Analytical Limits of Sequences** – Find the limit of the following sequences by evaluating as a limit, or by using a theorem in your textbook

**8**. $a_n = \sin\frac{\pi n}{2}$

**9**. $a_n = (-1)^n \sqrt[n]{n}$

**10**. $a_n = \frac{n!}{n^n}$