



CALCULUS II  
SPRING 2011

ASSIGNMENT 9.1  
DUE OCTOBER 21

**Exercise 1.** List the first five terms of the sequence  $a_1 = 4$ ,  $a_{n+1} = \frac{a_n}{a_n - 1}$ .

**Exercise 2.** Find a formula for the general term  $a_n$  of the sequence  $\{5, 1, 5, 1, 5, 1, \dots\}$ .

**Exercises 3 - 11:** Determine whether the sequence converges or diverges. If it converges, find the limit.

**Exercise 3.**  $a_n = \frac{3 + 5n^2}{n + n^2}$

**Exercise 4.**  $a_n = \frac{(-1)^n n^3}{n^3 + 2n^2 + 1}$

**Exercise 5.**  $a_n = \cos(n/2)$

**Exercise 6.**  $a_n = \tan\left(\frac{2n\pi}{1 + 8n}\right)$

**Exercise 7.**  $a_n = \sqrt{\frac{n+1}{9n+1}}$

**Exercise 8.**  $a_n = \ln(n+1) - \ln n$

**Exercise 9.**  $a_n = \sqrt[n]{2^{1+3n}}$

**Exercise 10.**  $a_n = \frac{\sin 2n}{1 + \sqrt{n}}$

**Exercise 11.**  $\{0, 1, 0, 0, 1, 0, 0, 0, 1, \dots\}$

**Exercise 12.** Determine whether the sequence defined as follows is convergent or divergent:

$$a_1 = 1, a_{n+1} = 4 - a_n \text{ for } n \geq 1.$$

What happens if the first term is  $a_1 = 2$  instead?