Calculus Section 9.5 Alternating Series Test
-Use the alternating series test to determine convergence

Homework: page 625 #’s 5 – 21 odd

Most of the tests that we’ve used so far have dealt with only positive terms (geometric test withstanding). A series whose terms switch between positive and negative is called an **alternating series**. An alternating series cannot have two terms of the same sign back-to-back.

**Alternating Series Test**Let an > 0. The alternating series:
 
will converge if the following two conditions are met:
1)  and 2) for all n

If the test fails the first condition, then the series diverges by the nth term test.
 **Example) Using the Alternating Series Test**
Determine the convergence or divergence of

$$\sum\_{n=1}^{\infty }(-1)^{n+1}\frac{1}{n}$$

**Example) Use the Alternating Series Test**
1) 2)

$$\sum\_{n=1}^{\infty }\frac{1}{n^{2}}cos⁡(πx)$$

$$\sum\_{n=1}^{\infty }\frac{n}{(-2)^{n-1}}$$

3)

$$\sum\_{n=1}^{\infty }\frac{\left(-1\right)^{n+1}(n+1)}{n}$$