SECTION 11.6 ABSOLUTE CONVERGENCE AND THE RATIO AND ROOT TESTS

- A series $\sum a_n$ is absolutely convergent if the series of absolute values $\sum |a_n|$ converges
- A series is conditionally convergent if it is convergent but not absolutely convergent
- If a series $\sum a_n$ is absolutely convergent, then it is convergent.
- Ratio Test: If $\lim_{n\to\infty} \left|\frac{a_{n+1}}{a_n}\right| = L < 1$, then $\sum_{n=1}^{\infty} a_n$ is absolutely convergent.
  If $\lim_{n\to\infty} \left|\frac{a_{n+1}}{a_n}\right| = L > 1$ or $= \infty$, then $\sum_{n=1}^{\infty} a_n$ is divergent.
- Root Test: If $\lim_{n\to\infty} \sqrt[n]{|a_n|} = L < 1$, then $\sum_{n=1}^{\infty} a_n$ is absolutely convergent.
  If $\lim_{n\to\infty} \sqrt[n]{|a_n|} = L > 1$ or $= \infty$, then $\sum_{n=1}^{\infty} a_n$ is divergent
- Beware of rearranging terms in conditionally convergent series, because it may result in a different sum!

SECTION 11.7 STRATEGY FOR TESTING SERIES.

Review this section and make sure to understand which test to use in which instance.

SECTION 11.8 POWER SERIES

- A power series is in the form $\sum_{n=0}^{\infty} c_n x^n$
- A series of the form $\sum_{n=0}^{\infty} c_n (x-a)^n$ is a power series centered at a.
- For a power series $\sum_{n=0}^{\infty} c_n (x-a)^n$, there are three possibilities
  (i) Series converges when $x=a$.
  (ii) Series converges for all x.
  (iii) Positive number R exists such that the series converges if $|x-a|<R$ and diverges if $|x-a|>R$.
- R is the radius of convergence of the power series
  In case (i), $R=0$. In case (ii), $R=\infty$.
- The interval of convergence is the interval that contains all values of x for which the series converges.