**Series -** a sum of a list (*usually* never ending) of never-ending terms written as $\sum_{n=i}^{k} a_n$

- **Infinite Series -** A series that is a sum of an infinite sequence of terms (there is no final term)
- **Divergent Series -** An **infinite** series that doesn't have a finite limit (every term, the sum always increases)
- **Infinite Divergent Series -** A series of infinite terms that doesn't have a final limit
    - **Harmonic Series -** an example of divergent infinite series $\sum_{n=1}^{\infty} \frac{1}{n} = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \cdots$
- *Example* **Power Series -** $\sum_{n=0}^{\infty} c_n x^n$
    - We can represent the power series with a function of x, $\mathbf{f(x) = c_0 + c_1x + c_2x^2 + \ldots}$

**Taylor Series - A series that estimates what a function looks like**

- A **power** series that tells us what a function looks like when centered at some point **a**
- A Taylor series is saying that we can approximate a function **f(x)** at **x = a**, with some Taylor series **t(x)** at **x = a**, where **t(x)** is a series (a sum of terms) of polynomials that approximate **f(x)** at **x = a**
    - **Taylor Series** is for using **polynomial functions to approximate non-polynomial functions**
        - Polynomials tend to be easier to compute, differentiate, etc.
- **Maclaurin Series -** a special kind of Taylor series, where we look at a function centered at **0**, i.e. **a = 0**