8.3
\[ \int_{a}^{b} f(x) \, dx = \lim_{b \to \infty} \int_{a}^{b} f(x) \, dx \]
\[ \int_{a}^{b} f(x) \, dx = \lim_{a \to -\infty} \int_{a}^{b} f(x) \, dx \]
\[ \int_{b}^{a} f(x) \, dx = \lim_{a \to -\infty} \int_{a}^{0} f(x) \, dx + \lim_{b \to \infty} \int_{b}^{0} f(x) \, dx \]

8.4 Realize what goes wrong when your integrand is undefined at points in the interval of integration

Ex. \[ \int_{-5}^{5} \frac{1}{x-2} \, dx = \lim_{t \to 2^-} \int_{-5}^{t} \frac{1}{x-2} \, dx + \lim_{t \to 2^+} \int_{t}^{5} \frac{1}{x-2} \, dx \]

Can't integrate over intervals which contain singularities, i.e. points which make the denominator 0.

9.1
- limits of rational functions
  - Thm A Properties of limits of Sequences
  - Thm B Squeeze Theorem

9.2
- Definition of convergence of a series via limit of sequence of partial sums.
  - Geometric Series
  - Thm A "n^{th} Term Test For Divergence"!
    (especially its contrapositive)
- collapsing (telescoping) series
- Thm B Linearity of Convergent Series

9.3 - Integral Test
- P-series Test \( \frac{\text{Make sure you know the hypotheses and conclusions.}}{} \)

9.4 - Comparison Test
- Limit Comparison Test
- Ratio Test

9.5 - Alternating Series Test
- Absolute Convergence Test
- Absolute Ratio Test
\( \text{Also know the definitions of absolute and conditional convergence.} \)

9.6 - Def of convergence set
- Thm A "Three possible Types of Convergence Sets for Power Series"
- Def of radius of convergence
- How to use the Absolute Ratio Test to find the radius of convergence and convergence set
- What does \( r = 1 \) imply?
- How to test endpoints for convergence/divergence.
9.7

\[ \frac{1}{1-x} = 1 + x + x^2 + x^3 + x^4 + \cdots = \sum_{n=0}^{\infty} x^n \]

- Know how to make small changes to above power series to get new power series.
- Know how to
  - differentiate
  - integrate
  power series term by term to get new power series.
- Don't worry about multiplying and dividing power series.