

8.3

- $\int_a^{\infty} f(x) dx = \lim_{b \rightarrow \infty} \int_a^b f(x) dx$

- $\int_{-\infty}^b f(x) dx = \lim_{a \rightarrow -\infty} \int_a^b f(x) dx$

- $\int_{-\infty}^{\infty} f(x) dx = \lim_{a \rightarrow -\infty} \int_a^0 f(x) dx + \lim_{b \rightarrow \infty} \int_0^b f(x) dx$

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

Ex

$$\int_{-5}^5 \frac{1}{x-2} dx = \lim_{t \rightarrow 2^-} \int_{-5}^t \frac{1}{x-2} dx + \lim_{t \rightarrow 2^+} \int_t^5 \frac{1}{x-2} dx$$

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 "nth Term Test for Divergence"!
(especially its contrapositive)

- collapsing (telescoping) series
- Thm B Linearity of Convergent Series

9.3

- Integral Test
- P-series Test

} 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

• 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 $\rho = 1$ imply?
- How to test endpoints for convergence/divergence.

9.7

- $\frac{1}{1-x} = 1 + x + x^2 + x^3 + x^4 + \dots = \sum_{n=0}^{\infty} x^n$

- Know how to make small changes to above power series to get new power series,

- Know how to
 - differentiate \int
 - integrate

power series term by term to get new power series,

- Don't worry about multiplying and dividing power series.