

## Math 107H      Checklist of topics covered

### *Fundamental Theorem of Calculus*

- Riemann sums
- Antiderivatives
- Basic integration rules and formulae

### *Techniques of Integration*

- Integration by substitution
- Integration by parts
- Trigonometric substitution
- Trigonometric integrals
- Partial fractions
- Improper integrals
- Numerical Integration

### *Applications of Integration*

- Area between curves
- Volume by slicing
  - Disks and washers
- Volume by cylindrical shells
- Arclength
- Surface area
- Center of mass / centroids
- Work

### *Sequences and Infinite Series*

- Limits of sequences and series
- $n$ -th term test
- Integral test
- Comparison test
- Limit comparison test
- Ratio test
- Alternating series and absolute convergence

### *Power Series*

- Geometric series
- Radius of convergence
- Taylor series and Taylor polynomials
- Error estimates
- New series from old
- Integration and differentiation of power series
- Fourier series

### *And finally...*

- Polar coordinates
- Arclength and area in polar coordinates