

Calculus 1 B : Topics

Module	block 1B, year 2019 - 2020
Book	Thomas' Calculus, Early Transcendentals, 12 th edition
Version	V01: 6 November 2019

Ch 4/5	Integration
4.8	- Antiderivatives
5.1	- Area and estimating with finite sums
	- Average value of a nonnegative continuous function
5.2	- Partitions of an interval and Riemann sums
5.3	- The definite integral and rules
	- Integrability of (piecewise-) continuous functions
	- Area under the graph of a nonnegative integrable function
	- Average value (mean) of an integrable function
5.4	- The Fundamental Theorem of Calculus (part1 and part 2)
	- Relationship between integration and differentiation
5.5	- The substitution method to evaluate indefinite integrals
5.6	- The substitution method to calculate definite integrals
	- Definite integrals of even and odd functions over a symmetric interval
	- Areas between curves

Ch 8	Techniques of Integration
8.1	- The technique of integration by parts for (in)definite integrals
8.7	- Convergence or divergence of improper integrals
	- Integrals with infinite limits of integration
	- Integrals of functions with vertical asymptotes

Ch 7/9	First-Order Differential Equations
7.2	- Models of exponential change
9.1	- First-order differential equations and first-order initial value problems
	- (Particular) solution and the general solution
	- Slope fields
9.2	- Solve first-order linear differential equations using integrating factor
9.3	- Applications, examples

Ch 10	Infinite Sequences and Series
10.7	- Power series
	- Geometric series
10.8	- Taylor and McLaurin series
	- Taylor polynomials

Calculus 1 B : Topics (continued)

Ch 17	Second-Order Differential Equations
17.1	- Second-order linear differential equations, (non)homogeneous - General solution of a constant-coefficient homogeneous linear differential equation, the characteristic equation
17.2	- General solution of a constant-coefficient nonhomogeneous linear differential equation - Method of undetermined coefficients
17.3	- Applications to vibrations or electric circuits

App A.7	Complex Numbers
	- Real part, imaginary part, complex conjugate - Absolute value, argument, polar form - Geometric representations of a complex number - Euler's formula, De Moivre's Theorem - Complex arithmetic operations and related geometric illustrations - Roots of a complex number and the Fundamental Theorem of Algebra