City College of CUNY   MATH 20100 EF   Spring 2022

Instructor: Mr. Chun S. Park
Office: (NA-8/133)   Phone: (212) 650-5346   Office hours: Mondays & Wednesdays: 4:30PM-6:00PM
e-mail: cpark@ccny.cuny.edu   Math Dept. web page: http://math.sci.ccny.cuny.edu

1. Text: Thomas' Calculus, Early Transcendentals, 14th edition, by Hass, Heil & Weir, 2018, Pearsong: [ebook & access code: about $80 Available in Pearson's MyLab page] {Hardcover books cost more, see attached sheets for the prices and information on how to purchase at a discounted price}
2. I will be using Pearson's MyLab on-line HW as extra credit for the course (On-line HW must be done by the due date in order to obtain extra credit; Maximum 5% of extra credit towards class average).
3. Exam schedule and possible resources from Mr. Park (**available in CCNY Math Dept web page of Mr. Park**). This item is located at CCNY Math Dept Web Page [**http://math.sci.ccny.cuny.edu**]
4. The official last day of Spring 2022 is Tuesday, May 24, 2022. This means book any getaway plans (if you are going to have it) to start on or after Wednesday, May 25, 2022.

Grades: Final grade will be composed 60% of your class average (up to 5% extra credit for on-line HW added) and 40% of your final exam. The class average will be the average of 4 best of 5 in class examinations. There will be no make up exams.

Letter Grade											

	Grading Scale										
Letter Grade	Passing								Failing		
	A+	A	A-	B+	B	B-	C+	C	C-	D	F
%	97-100	95-96	90-94	87-89	84-86	80-83	77-79	74-76	70-73	60-69	0-59
GPA	4.00	4.00	3.66	3.33	3.00	2.66	2.33	2.00	1.66	1.00	0.00

Syllabus

Sections and HW

Section	Topics	Page	Exercises
1.1	Functions and Their Graphs	11	1, 3, 5, 7, 13, 15, 17, 19, 25,27, 47, 49, 51, 53, 55
1.2	Combining Functions; Shifting and Scaling Graphs	18	1,3, 5, 7, 9, 11, 17, 19, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 59, 61, 69, 71
1.3	Trigonometric Functions	27	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 61
1.5	Exponential Functions	37	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 29, 31, 35
1.6	Inverse Functions and Logarithms	48	1, 3, 5, 7, 9, 11, 13, 15, 25, 27, 29, 31, 33, 35, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 71, 73, 77, 85
2.1	Rates of Change and Tangents to Curves	61	1, 3, 5, 7, 9, 11, 13, 15, 17, 23, 25
2.2	Limit of a Function and Limit Laws	71	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 79, 81
2.3	The Precise Definition of a Limit	80	7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 37, 39, 41, 43, 45, 47, 49, 57
2.4	One-Sided Limits	88	1, 3, 5, 11, 13, 15, 17, 19, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49
2.5	Continuity	100	5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 57, 63, 65, 69
2.6	Limits Involving Infinity; Asymptotes of Graphs	113	3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 53, 55, 57, 63, 65, 67, 69, 71, 73, 75, 81, 87, 89, 91
3.1	Tangents and the Derivative at a Point	124	5, 7, 9, 11, 13, 15, 17, 19, 21, 25, 27, 35, 39

3.2	The Derivative as a Function	130	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 41, 43
3.3	Differentiation Rules	142	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 45, 47, 49, 51, 55, 59, 65, 69, 71, 77
3.4	The Derivative as a Rate of Change	150	1, 3, 5, 7, 13, 15, 19, 25
3.5	Derivatives of Trigonometric Functions	158	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 39, 41, 49, 51, 53, 55, 59, 67
3.6	The Chain Rule	166	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 97, 111, 113
3.7	Implicit Differentiation	172	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 45, 53, 57
3.8	Derivatives of Inverse Functions and Logarithms	183	3, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 102
3.9	Inverse Trigonometric Functions	189	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 51, 53, 56
3.10	Related Rates	196	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47
3.11	Linearization and Differentials	209	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 45, 47, 49, 51, 53, 55, 57, 59, 61, 66
4.1	Extreme Values of Functions	227	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 71, 73
4.2	The Mean Value Theorem	235	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 53, 63
4.3	Monotonic Functions and the First Derivative Test	241	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, {parts a, b only: 47, 49, 51, 55, 57}, {part a only: 59, 61, 63, 65}, 71, 83, 85
4.4	Concavity and Curve Sketching	251	1, 3, 5, 9, 13, 17, 21, 25, 27, 29, 33, 39, 45, 49, 55, 85, 97, 89, 91, 93, 95, 97, 99, 101
4.5	Indeterminate Forms and L'Hôpital's Rule	262	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 85
4.6	Applied Optimization	269	3, 5, 7, 11, 15, {17 a, d, e, f}, 21-a, 35, 37, 43, 45, {53 a, b, c}, 67
4.8	Antiderivatives	287	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 123
5.1	Area and Estimating with Finite Sums	308	1, 3, 5, 7, 9
5.2	Sigma Notation and Limits of Finite Sums	316	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 43, 45, 47, 49
5.3	The Definite Integral	326	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 79
5.4	The Fundamental Theorem of Calculus	339	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69
5.5	Indefinite Integrals and the Substitution Method	348	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 736, 75, 77, 79
5.6	Substitution and Area Between Curves	355	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 736, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103