

Syllabus for Math 102, Fall '07-'08, Clark Bray

Mathematics for Economists, Simon and Blume; Notes on Integrals for Math 102, Bray

(Note: New homework problems will be added throughout semester; be sure you are looking at a current version!)

Linear Algebra (S&B)

7.1 - Gaussian and Gauss-Jordan Elimination	Exercises: 3, 7, 8
7.2 - Elementary Row Operations	Exercises: 9, 10, 11, 12
7.3 - Systems With Many or No Solutions	Exercises: 15, 16, 17, 18, 19
7.4 - Rank - The Fundamental Criterion	Exercises: 21, 23, 24
7.5 - Linear Implicit Function Theorem	Exercises: 25, 29, 30
8.1 - Matrix Algebra	Exercises: 1, 3, 4(once), 5b
8.2 - Special Kinds of Matrices	Exercises: 7, 9, 10
8.3 - Elementary Matrices	Exercises: 12, 14
8.4 - Algebra of Square Matrices	Exercises: 18, 19ad, 20c, 21, 23, 28
9.1 - Determinant of a Matrix	Exercises: 5, 6, 9
9.2 - Uses of the Determinant	Exercises: 11, 13b, 14b
9.3 - IS-LM Analysis via Cramer's Rule	Exercises: 17
10.1 - Points and Vectors in Euclidean Space	Exercises:
10.2 - Vectors	Exercises: 3, 4
10.3 - Algebra of Vectors	Exercises: 8, 9
10.4 - Length and Inner Product in \mathbb{R}^n	Exercises: 10a, 11b, 13, 19, 20, 24, 25, 26
10.5 - Lines	Exercises: 27, 29, 31
10.6 - Planes	Exercises: 32, 34, 37, 39, 40, 41
10.7 - Economic Applications	Exercises:
11.1 - Linear Independence	Exercises: 1, 3, 4, 5b, 6, 7, 8
11.2 - Spanning Sets	Exercises: 9, 10
11.3 - Basis and Dimension in \mathbb{R}^n	Exercises: 14

Calculus of Several Variables (S&B)

13.1 - Functions Between Euclidean Spaces	Exercises:
13.2 - Geometric Representations of Functions	Exercises: 1, 2, 3, 6, 9, 10
13.3 - Special Kinds of Functions	Exercises: 11, 12, 14, 15
13.4 - Continuous Functions	Exercises:
13.5 - Vocabulary of Functions	Exercises: 22, 23(largest possible domain; let range = \mathbb{R}^1), 24
14.1 - Definitions and Examples	Exercises: 1, 2
14.2 - Economic Interpretation	Exercises:
14.3 - Geometric Interpretation	Exercises: 3, 4, 5a
14.4 - Total Derivative	Exercises: 7, 8, 9, 10
14.5 - Chain Rule	Exercises: 11, 12, 13, 14, 15, 16, 17
14.6 - Directional Derivatives and Gradients	Exercises: 18, 19, 20
14.7 - Explicit Functions From \mathbb{R}^n To \mathbb{R}^m	Exercises: 21, 22
15.1 - Implicit Functions and Their Derivatives	Exercises: 1, 2, 5, 6, 7, 9
15.2 - Level Curves and Their Tangents	Exercises: 10, 11, 12, 13
15.3 - Systems of Implicit Functions	Exercises: 15, 16, 17, 18, 19, 20, 21, 24
15.4 - Applications: Comparative Statics	Exercises: 31
15.5 - Inverse Function Theorem	Exercises: 35, 36, 37, 38, 39

Optimization (S&B)

16.1 - Quadratic Forms	Exercises:
16.2 - Definiteness of Quadratic Forms	Exercises: 1, 2, 3, 4
16.3 - Linear Constraints and Bordered Matrices	Exercises: 6c
17.1 - Definitions	Exercises:
17.2 - First Order Conditions	Exercises:
17.4 - Global Maxima and Minima	Exercises:
17.5 - Economic Applications	Exercises: 4, 6, 7, 8, 11
18.1 - Examples	Exercises:
18.2 - Equality Constraints	Exercises: 2, 4, 5, 6, 7, 8
18.3 - Inequality Constraints	Exercises: 10, 11, 14
18.4 - Mixed Constraints	Exercises: 15 (' \leq ' not ' \geq ')

Integration (B)

1.1 - Single Variable Integrals	Exercises: BEW(1,2)
1.2 - Double Integrals	Exercises: ALJ(1, 2, 10, 11, 15, 23, 24), BEW(1, 3)
1.3 - Nested Integrals, Examples	Exercises: ALJ(1, 2, 3, 6, 10, 19, 20, 23, 24), BEW(1, 3)
1.4 - Non-Rectangular Domains, Examples	Exercises: ALJ(2, 3, 4, 6, 7, 10, 11, 15, 16, 17)
1.5 - Triple Integrals, Examples	Exercises: BEW(2, 3, 5, 6, 7, 9, 10, 11, 13, 14)
1.7 - Polar Coordinates	Exercises: BEW(1, 2, 5, 7, 8, 11, 12, 13, 15, 16, 17)