

## Econ 340: Guide to the material covered in Econ 340

The following lists the material covered in class and on the quizzes, by week:

- Quiz #1: Klein 1, 2; Schaums 1, 2 (Functions and algebra review)
- Quiz #2: Schaum's 7, 8 (Exponents and Logs)
- Quiz #3: Schaum's 3
- Quiz #4: Schaum's 4, 9
- Quiz #5: Schaum's 3, 7, and 9 (review of calculus)
- Quiz #6: Schaum's 4, 8 and 9 (a review of economic applications)
- Quiz #7: Schaums' 5 and 6
- Quiz #8: Schaum's 5 and 6 (focus on economic applications)
- Quiz #9: Schaum's 5 and 6 (Unconstrained optimization)
- Quiz #10: Schaum's 5 and 6 (Constrained optimization – Lagrangians)
- Quiz # 11: Schaum's 5 and 6 (Unconstrained optimization) again
- Quiz # 12: Schaum's 10 and 11 (introduction to Linear Algebra)

The following outline lists exactly which parts of Schaum's we have covered, including both the text and the solved problems.

Chapter 1 – ALL text and problems

Chapter 2: Economic Applications of Graphs and Equations.

We covered the first part of this chapter:

- 2.1 Isocost Lines, Example 1; Solved Problems (Graphs) 2.5, 2.6,
- 2.2 Supply and Demand Analysis, Example 2: Solved Problems (Graphs) 2.1 – 2.4, 2.11 – 2.16

We did not cover the following, so you may skip the following:

- 2.3 Income Determination Models.
- 2.4 IS-LM Analysis, Solved Problems 2.7 – 2.10, 2.17 – 2.24

Chapter 3: The Derivative and the Rules of Differentiation – ALL text and problems.

Chapter 4: Uses of the Derivative in Mathematics and Economics.

All of Chapter EXCEPT a couple of the solved problems: You may skip the following:  
The Marginal Rate of Technical Substitution, problems 4.24, 4.25.

Chapter 7: Exponential and Logarithmic Functions – ALL text and problems.

Chapter 8: Exponential and Logarithmic Functions in Economics

We covered the following parts of Chapter 8:

- 8.1 Interest Compounding, Example 1; Solved Problems 8.1 – 8.8.
- Timing (not a unit – solved problems related to interest compounding), Problems 8.9 – 8.17
- 8.3 Discounting, Example 3; Solved problems 8.18 – 8.22

Exponential Growth Functions (not a separate unit), Solved Problems 8.23 – 8.36  
8.5 Estimating Growth Rates from Data Points, Ex 7; Solved Problems 8.43 – 8.45 (Establishing exponential functions from data)

We did not cover the following, so you may skip the following:

8.2 Effective versus nominal rates of interest, Example 2  
8.4 Converting Exponential to Natural Exponential Fcns, Ex 4, 5 and 6; Problems 8.37 – 8.42

Chapter 9: Differentiation of Exponential and Logarithmic Functions

We covered everything in chapter 9 EXCEPT taking the derivative of a log or exponent with a base other than  $e$ , so you may skip the following:

Unit 9.1.2 The exponential fcn rule for the drv for base  $a$  other than  $e$ , Ex 2; Solved problems 9.2  
Unit 9.1.4 The Logarithmic Function Rule for base  $a$  other than  $e$ , Ex 4; Solved problems 9.6

We are currently working on these chapters – the sections marked with a \* we have not learned YET, but we will:

Chapter 5: Calculus of Multivariable Functions

5.1 Functions of Several Variables and Partial Derivatives (IMPORTANT), Examples 1 and 2;  
5.2 Rules of Partial Differentiation, Examples 4 – 7; Solved Problems 5.1 – 5.5  
5.3 Second Order Partial Derivatives, Examples 6 and 7; Solved Problems 5.6 – 5.9  
5.4 Optimization of Multivariable Functions, Example 8; Solved Problems 5.10 – 5.11  
5.5 Constrained optimization with LaGrange Multipliers, Ex. 9; Solved Problems 5.12 – 5.14  
5.6 Significance of the LaGrange Multiplier, Ex. 10; Solved Problems (see above unit 5.5)  
5.7 Differentials, Examples 11 and 12; Solved Problems 5.15 – 5.17  
5.8 Total and Partial Derivatives, Ex. 12; Solved problems see below unit 5.9  
5.9 Total Derivatives. Ex. 13 – 15; Solved Problems 5.18 – 5.19  
5.10 Implicit and Inverse Function Rules, Ex 16 and 17; Solved Problems 5.20 – 5.22

Chapter 6: Calculus of Multivariable Functions in Economics

6.1 Marginal Productivity (and other marginal concepts), Solved Problems 6.1 – 6.3  
6.3 Income and Cross Price Elasticities of Demand, Ex. 1 and 2; Solved Problems 6.18 – 6.21  
6.4 Differentials and Incremental Changes, Ex 3 (skip example 4); Solved Problems 6.45 – 6.52  
6.5 Optimization of Multivariable Fcns in Econ, Ex 5 and 6; Solved Problems 6.22 – 6.27  
6.6 Constrained optimization multivariable fcn in Econ, Ex 7: Solved Problems 6.28 – 6.39  
6.7 Homogenous Production Functions, Ex 8; Solved Problem 6.40.  
6.8 Returns to Scale, See Problem 6.40  
Optimization of Cobb-Douglas Production Fcns, Ex 9 – 11; Solved Problems 6.41 – 6.42

We will not cover the following parts of Chapter 6, so you may skip them:

6.2 Income Determination and Multipliers and Comparative Statics  
Solved problems 6.4 – 6.17 (whee – a lot of problems you can ignore!)  
6.10 Optimization of Constant Elasticity of Substitution Production Functions  
Solved Problems 6.43 – 6.44, 6.59 – 6.69

## Chapter 10: The Fundamentals of Linear (or Matrix) Algebra

For chapter 10, all the Solved Problems, 10.1 – 10.51, are on material we worked on in class.

10.1 The Role of Linear Algebra: Solved problems 10.1 –

10.2 Definitions and Terms

10.3 Addition and Subtraction of Matrices

10.4 Scalar Multiplication

10.5 Vector Multiplication

10.6 Multiplication of Matrices

10.7 Commutative, Associative, and distributive laws in Matrix Algebra

10.8 Identity and Null Matrices

10.9 Matrix Expression of a system of linear equations

## Chapter 11: Matrix Inversion

For Chapter 11, Solved problems 11-1, 2, 3, 13, 14, 15, 17.

11.1 Determinants and non-singularity

11.2 Third order determinants

11.8 Solving Linear Equations with the inverse (just the concept, we did not actually learn how to find the inverse.)

Skip 11.3 – Minors and cofactors, 11.4 – Laplace expansion and higher order determinants, 11.6

– Cofactor and Adjoint Matrices, 11.7 – Inverse matrices, 11.9 – Cramer's rule