SUBJECTS OF THE MIDTERM

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For announcements about the course, homeworks, results of your examinations, etc., see the COURSE WEB PAGE:


web page of the textbook for some supplements:
[http://media.pearsoncmg.com/aw/aw_thomas_series_cw/tuc02/tuc02_student_launch.html](http://media.pearsoncmg.com/aw/aw_thomas_series_cw/tuc02/tuc02_student_launch.html)

GRADING:
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MIDTERM DATE: 29th November, 2012 Thursday
Time: 13:00 Classrooms: B253, 254, 255, 256

SUBJECTS OF THE MIDTERM. All of the first four chapters of your textbook (except Section 4.8), Section 7.3 of Chapter 7 and some appendices of your textbook:

- **Preliminaries**: Real Numbers and The Real Line; Mathematical Induction; Theory of Real Numbers; Complex Numbers; Lines, Circles and Parabolas; Conic Sections; Basic Algebra, Geometry and Trigonometry Formulas. → **Appendices A.1, A.2, A.3, A.4, A.7 and A.8.**

- **Functions**: Functions and Their Graphs; Combining Functions, Shifting and Scaling Graphs; Graphing with Calculators and Computers; Composition of Functions; Polynomial Functions; Rational Functions; Algebraic Functions; Transcendental Functions; Trigonometric Functions; Exponential Functions; Inverse Functions; Logarithms; Inverse Trigonometric Functions; Hyperbolic Functions; Inverse Hyperbolic Functions. → **All of Chapter 1 and Section 7.3.**

- **Limits and Continuity**: Rates of Change and Tangents to Curves; Limit of a Function and Limit Laws; Precise Definition of a Limit; Proofs of Limit Theorems; One-Sided Limits; Continuity; Limits Involving Infinity; Asymptotes of Graphs.

  → **All of Chapter 2 and Appendix A.5.**

- **Differentiation**: Tangents and the Derivative at a Point; The Derivative as a Function; Differentiation Rules; The Derivative as a Rate of Change; Linearization and Differentials; Derivatives of Trigonometric Functions; The Chain Rule; Implicit Differentiation; Derivatives of Inverse Functions and Logarithms; Derivatives of Inverse Trigonometric Functions; Derivatives of Hyperbolic and Inverse Hyperbolic Functions; Related Rates. → **All of Chapter 3 and Section 7.3.**

- **Applications of Derivatives**: Extreme Values of Functions; The Mean Value Theorem; Monotonic Functions and the First Derivative Test; Concavity and Curve Sketching; Indeterminate Forms and L'Hôpital’s Rule; Proof of L'Hôpital’s Rule; Applied Optimization; Newton’s Method.

  → **All of Chapter 4 except Section 4.8.**

**ANSWERS TO PROBLEMS.** We have given the answers to the problems of your textbook. Take a copy of the handwritten notes that Celal Cem Sarıoğlu has given in the previous year; it contains some summary and detailed solutions to many problems. These well written answers to the problems will show you how you must write your answers in a mathematically correct way. He has also given notes on graphing functions that contains many graphing examples.

**EXAMINATIONS OF THE PREVIOUS THREE YEARS.** We have given a copy of the previous three years’ midterms and final examinations with detailed answers. Take a copy of these. Make yourself a two and a half hour examination from these midterms. Then check the answers to learn how you shall write your answers by making enough explanations.