The final exam date: [sec. 16] 12/15 (Wed), 12:00 – 2:00, at EJCH 252.
[sec. 10] 12/14 (Tue), 4:30 – 6:30, at AB 635.

In principle, it will cover all the topics we did in class. It will be helpful to read earlier exam papers and quizzes (the solutions for exams and quizzes were given out), the practice problem sets, the examples and problems from the textbook (like HW’s). For the final exam, you are again allowed to bring one (=1) sheet of paper for your reference. Please bring also your calculator.

[General structure of the final exam]: There will be about five or so True/False questions (mostly conceptual, no long computations necessary) and twelve or so multiple-choice problems. For these, no work need to be shown (On the other hand, no partial credit will be given). In addition, there will be about six/seven problems where you will be asked to show all your work. Tentative scoring scheme will be:

\[ T/F(4 \times 5) + MC(6 \times 12) + P((15 \text{ to } 20) \times 7) = 225, \]

but it could change (Considering the length, etc.). Please ask, if you have questions.

[The topics]:

- (1.1)–(1.3): Functions, Domain, Composition
- (1.5), (1.6): Exponential function, Log function, Inverse
- (1.7): Parametric curves
- (2.1)–(2.3), (2.5): Limits (See also §(4.5): L’Hospital’s Rule), Vertical/Horizontal asymptotes
- (2.4): Left/Right limits, Continuity
- (2.6), (2.7), (2.8): Derivatives (Slope of tangent line, Velocity, Rate of change)
- (2.9): Linear approximation (See also §(3.8): Differentials)
- (2.10): Relationship between \( f \) and \( f' \) (See also §(4.9), §(5.4))
- (3.1), (3.2), (3.4), (3.5): Differentiation rules (Product rule, Quotient rule, Chain rule, . . .)
- (3.3): Derivative as an (instantaneous) rate of change (See also §(2.6))
- (3.6): Implicit differentiation (See also §(4.1): Related rates)
- (3.7): Derivatives involving Log functions
- (3.8): Differentials (See also §(2.9): Linear approximation)
- (4.1): Related rates
- (4.2), (4.3): Absolute min/max, Local min/max, Concavity, Inflection point
- (4.5): L’Hospital’s Rule for indeterminate limits (See also §(2.3), §(2.5))
- (4.6): Optimization problems
- (4.7): Economics applications
- (4.8): Newton’s approximation method for finding roots (solutions) of an equation
• (4.9): Antiderivatives
• (5.1), (5.2): Definite integrals, Riemann sum, “area” problems
• (5.3), (5.4): Evaluating definite integrals, Fundamental theorem of calculus, Finding derivative of an integral

(NOTE): As announced in class, among the six or seven “long” problems will be about the following topics:

• Finding derivative by using limit definition. Using chain rule, product/quotient rule
• Implicit differentiation, Related rates
• Min/Max problem, Optimization
• Antiderivatives
• Definite integral and (signed) area
• ...

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