

QUIZ 4 STUDY GUIDE

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Note: This quiz (as well as quiz 5) will be harder than the other quizzes! My main objective for this quiz is to have an average of 7.5/15, with scores evenly spread out from 0 to 15. All of the items on the following list are fair game for the quiz, which will be on sections 3.10, 4.1, 4.2, and 4.3 of the book!

Know how to:

- Find the linearization of a function f at a a (3.10.1, 3.10.3)
- Use a linear approximation to estimate a given number, e.g. $\sqrt{98}$ (3.10.25, 3.10.27, 3.10.38)
- Given a graph, state the absolute/local maximum/minimum values of a function (4.1.5)
- Sketch the graph of a function with given properties having to do with local/absolute max/min (4.1.7, 4.1.10, 4.1.11, 4.1.14)
- Find the critical numbers of a given function (4.1.33, 4.1.35, 4.1.42, 4.1.44)
- Find the absolute max/min of a given function on a given closed interval (4.1.47, 4.1.51, 4.1.55, 4.1.61, 4.1.62, 4.1.63)
- **Use the Mean Value Theorem to:**
 - Show that an equation has at most one/two roots (4.2.19, 4.2.20, 4.2.22)
 - Show that an equation has **exactly** one root, using in addition the Intermediate Value Theorem (4.2.17, 4.2.18)
 - Estimate the value of a function (look at 4.2.23, 4.2.24, 4.2.25, 4.2.26)
 - Show that a function is less than another function (4.2.27)
 - Solve other problems using the mean value theorem (4.2.28, 4.2.29, 4.2.35)
- Show that two functions f and g are equal by differentiating them and plugging in one value for x (4.2.32, 4.2.33)
- Find intervals on which f is increasing/decreasing, finding the local max/min of f , as well as intervals of concavity and inflection points, given a graph or given a formula (4.3.8, 4.3.11, 4.3.13)
- Find a local max/min using the First and/or Second derivative tests (4.3.19)
- Sketch the graph of a function with given properties having to do with first/second derivatives (4.3.24, 4.3.26)

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