

# Calculus 1, Chapter 2 Study Guide

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The following is a *brief* list of topics covered in Chapter 2 of *Thomas' Calculus*. Test questions will be chosen directly from the text. This list is not meant to be comprehensive, but only gives a list of several important topics. I reserve the right to ask you definitions and theorems on the tests. If I do so, then I will choose from the **bold-faced** items below.

**2.1 Rates of Change and Tangents to Curves.** Average rate of change, slope of a curve

**2.2 Limits of a Function and Limit Laws.** Informal Definition of Limit, Limit Rules, limits of polynomials and rational functions, **Sandwich Theorem.**

**2.3 The Precise Definition of a Limit.** the formal definition of limit, given  $\epsilon$  find  $\delta$ .

**2.4 One-Sided Limits.** the formal definition of one-sided limit, **Theorem 6** (relationship between one- and two-sided limits),  $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$ .

**2.5 Continuity.** Continuity at an interior point and endpoint of the domain, the Continuity Test, **removable and jump discontinuities**, properties of continuous functions, composite functions, **Intermediate Value Theorem.**

**2.6 Limits Involving Infinity; Asymptotes of Graphs.** Formal definition of limits at infinity, rules for limits at infinity (Theorem 12), **horizontal asymptote**, oblique asymptote, **formal definition of limits which are infinite**, **vertical asymptote.**