

Calculus 1, Chapter 1 Study Guide

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The following is a *brief* list of topics covered in Chapter 1 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.

1.1 Rates of Change. Average rate of change, **the formal definition of limit**, given ϵ find δ .

1.2 Finding Limits and One-Sided Limits. Limit Rules (recall the error in Rule 6, the Power Rule), polynomials, rational functions, evaluate limits, **Sandwich Theorem**, one-sided limits, **Theorem 5** (relationship between one- and two-sided limits), $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$.

1.3 Limits Involving Infinity. $\lim_{x \rightarrow \pm\infty} f(x) = L$, Rules for limits involving infinity, infinite limits, horizontal asymptotes, vertical asymptotes.

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

1.5 Tangent Lines. **Slope of a Curve**, tangent line, instantaneous velocity, end behavior.