

Calculus 2, Chapter 7 Study Guide

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The following is a *brief* list of topics covered in Chapter 7 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.

7.1. The Logarithm Defined as an Integral. Natural logarithm, transcendental number, algebraic number, differentiation of log, Properties of Logarithms; integrals of tangent, cotangent, secant, and cosecant; natural exponential function, properties of exponentials, logarithms base a , conversion of base formula for logarithms.

7.2. Exponential Change and Separable Differential Equations. Law of exponential change, first-order differential equation, separable differential equation, radioactive decay, half-life, Newton's Law of Cooling.

7.3. Hyperbolic Functions. Definitions of the hyperbolic trig functions, identities, derivative and integral properties, inverse hyperbolic trig functions and their representation using logarithms, identities and integrals involving inverse hyperbolic trig functions, integrals leading to inverse hyperbolic trig functions.

7.4. Relative Rates of Growth. f grows faster than g as $x \rightarrow \infty$, f and g grow at the same rate as $x \rightarrow \infty$, f is of smaller order than g , f is of at most the order of g .