

Calculus 3, Chapter 15 Study Guide

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The following is a *brief* list of topics covered in Chapter 15 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.

15.1 Double and Iterated Integrals over Rectangles. Riemann sum for $f(x, y)$, norm of a partition, double integral, Fubini's Theorem, iterated integrals.

15.2 Double Integrals over General Regions. Volume, Fubini's Theorem (stronger form), finding limits of integration, reversing order of integration.

15.3 Area by Double Integration. Area, average value.

15.4 Double Integrals in Polar Form. Double integrals, area, changing from rectangular to polar coordinates.

15.5 Triple Integrals in Rectangular Coordinates. Volume, finding limits of integration, average value.

15.6 Moments and Centers of Mass. Mass, first moment about each coordinate plane, center of mass, centroid, moment of inertia about a line or axis.

15.7 Triple Integrals in Cylindrical and Spherical Coordinates. Cylindrical coordinates, integrals and finding limits of integration in cylindrical coordinates, spherical coordinates, integrals and finding limits of integration in spherical coordinates, conversion between rectangular/cylindrical/spherical coordinates.

15.8 Substitution in Multiple Integrals. Jacobian in double and triple integrals.