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Leon Hall* (lmhall@umr.edu), Department of Mathematics and Statistics, 1870 Miner Circle, Rolla, MO 65409-0020, and **Michael Dorff**, Department of Mathematics, Brigham Young University, Provo, UT 84602. *Derivative Relationships Between Volume and Surface Area*. Preliminary report.

Everyone knows that the derivative of the area of a circle with respect to the radius is the circumference, and that the derivative of the volume of a sphere is the surface area. Indeed, similar relationships hold in higher dimensions. For regular polygons and polyhedra, with the radius replaced by the apothem, the derivative of the “full-dimensional” measure is again the measure one dimension lower. Any region with well-defined measures of the analogs of volume and surface area has this property provided the independent variable is properly chosen. We geometrically characterize objects in two and three dimensions which have this property, and make some generalizations. Among our examples are general polygons and polyhedra, and generalizations of the bicylinder. (Received August 23, 2000)