Multivariable Calculus: Tutorial 12

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Progress Update

Over the past week I have been introduced to:

1. Triple integrals

Triple integrals

A triple integral is, intuitively, a sum of infinitely small cubes that make up some 3 dimensional region R; the volume of such a region is denoted

$$\iiint_R dv = \text{Volume} \tag{1}$$

A few more interesting uses of triple integrals occur, and we shall see them on the next slide.

Applications of triple integrals

A few applications of triple integrals are simply those seen in single or double integrals translated to 3 dimensions. Consider the following features of a 3-region:

1. Mass $= \iiint_R \delta \, dV$ (where δ is density at a point)
2. Center of mass on f axis $= \frac{1}{M} \cdot \iiint_R f \, dV$