MATH 1C Notecard

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15.1 Double Integrals over Rectangles

The single variable definite integral: $\int_a^b f(x)dx = \lim_{n\to\infty} \sum_{i=1}^{n} f(x_i^*)\Delta x$

Volume as a Double Riemann Sum: $V \approx \sum_{i=1}^{m}\sum_{j=1}^{n} f(x_{ij}^*, y_{ij}^*)\Delta A$

Volume as a Double Integral: $\int\int_R f(x,y)dA = \sum_{i=1}^{m}\sum_{j=1}^{n} f(x_{ij}^*, y_{ij}^*)\Delta A$

Fubini's Theorem

If f is continuous on the rectangle $R = \{(x,y) \mid a \le x \le b, c \le y \le d\}$

then it is known $\iint_R f(x,y)dA = \int_a^b \int_c^d f(x,y)\, dy\, dx = \int_c^d \int_a^b f(x,y)\, dx\, dy$

15.2 Double Integrals over General Regions

15.3 Double Integrals in Polar Coordinates

15.4 Applications of Double Integrals

15.5 Surface Area

15.6 Triple Integrals

15.7 Triple Integrals in Cylndrical Coordinates

15.8 Triple Integrals in Spherical Coordinates

15.9 Change of Variables in Multiple Integrals