	Notecards Application of Integration	
1	Area Bounded by 2 Functions …… In terms of dx???	$$Area = \int_{x_1}^{x_2} f(x) - g(x)dx$$ $$Area = \int_{x_1}^{x_2} top - bottom \; dx$$ Everything must be in terms of x. The limits on the integrand and the integrand!!
2	Area Bounded by 2 Functions …… In terms of dy???	$$Area = \int_{y_1}^{y_2} f(x) - g(x)dy$$ $$Area = \int_{y_1}^{y_2} right - left \; dy$$ Everything must be in terms of y. The limits on the integrand and the integrand!!
3	How do you find the volume of an object whose cross-sections are perpendicular to the $x -$axis?	$$Volume = \int_{x_1}^{x_2} Area \; dx$$
4	How do you find the volume of an object whose cross-sections are perpendicular to the $x -$axis?	$$Volume = \int_{y_1}^{y_2} Area \; dy$$
5	How do you find the volume of a **solid** revolved around the $x -$axis or parallel to the $x -$axis?	$$Volume = \pi \int_{x_1}^{x_2} (function - L.O.R)^2 \; dx$$
6	How do you find the volume of a **solid** revolved around the $y -$axis or parallel to the $y -$axis?	$$Volume = \pi \int_{y_1}^{y_2} (function - L.O.R)^2 \; dy$$
7	How do you find the volume of a **figure with a hole in it,** revolved around the $x -$axis or parallel to the $x -$axis?	$$Volume = \pi \int_{x_1}^{x_2} (outer \; function - L.O.R)^2$$ $$- (inner \; function - L.O.R)^2 \; dx$$
8	How do you find the volume of a **figure with a hole in it,** revolved around the $x -$axis or parallel to the $x -$axis?	$$Volume = \pi \int_{y_1}^{y_2} (function - L.O.R)^2$$ $$- (inner \; function - L.O.R)^2 \; dy$$
9	How do you calculate the average value of the function $f(x)$ over the interval $[a, b]$?	$$\frac{1}{b-a} \int_a^b f(x) \; dx$$