Areas and Volumes:

Area in terms of *x* (vertical rectangles): $\int_a^b (top - bottom)dx$	Area in terms of *y* (horizontal rectangles): $\int_c^d (right - left)dy$
General Volumes by Slicing: Given: Base and shape of Cross-sections $V = \int_a^b A(x)dx$ if slices are vertical $V = \int_c^d A(y)dy$ if slices are horizontal	Disk Method: For volumes of revolution laying on the axis with slices perpendicular to the axis $V = \int_a^b \pi\left[R(x)\right]^2 dx$ if slices are vertical $V = \int_c^d \pi\left[R(y)\right]^2 dy$ if slices are horizontal
Washer Method: For volumes of revolution not laying on the axis with slices perpendicular to the axis $V = \int_a^b \pi\left[R(x)\right]^2 - \pi\left[r(x)\right]^2 dx$ if slices are vertical $V = \int_c^d \pi\left[R(y)\right]^2 - \pi\left[r(y)\right]^2 dy$ if slices are horizontal	Shell Method: For volumes of revolution with slices parallel to the axis $V = \int_a^b 2\pi rh dx$ if slices are vertical $V = \int_c^d 2\pi rh dy$ if slices are horizontal