SATPREP
Volume of Solid of Revolution

## Volumes of Solids with Known Cross Sections

1. For cross sections of area $A(x)$, taken perpendicular to the $x$-axis:

$V = \int_a^b A(x)\,dx$

2. For cross sections of area $A(y)$, taken perpendicular to the $y$-axis:

$V = \int_a^b A(y)\,dy$

## Volumes of Solids of Revolution: Disk Method

$V = \int_a^b \pi\, r^2\,dx$

Rotated about the $x$-axis: $V = \int_a^b \pi\,[f(x)]^2\,dx$

Rotated about the $y$-axis: $V = \int_a^b \pi\,[f(y)]^2\,dy$

## Volumes of Solids of Revolution: Washer Method

$V = \int_a^b \pi\,(r_o^2\,dx - r_i^2)\,dx$

Rotated about the $x$-axis: $V = \int_a^b \pi\,[(f_1(x))^2 - (f_2(x))^2]\,dx$

Rotated about the $y$-axis: $V = \int_a^b \pi\,[(f_1(y))^2 - (f_2(y))^2]\,dy$