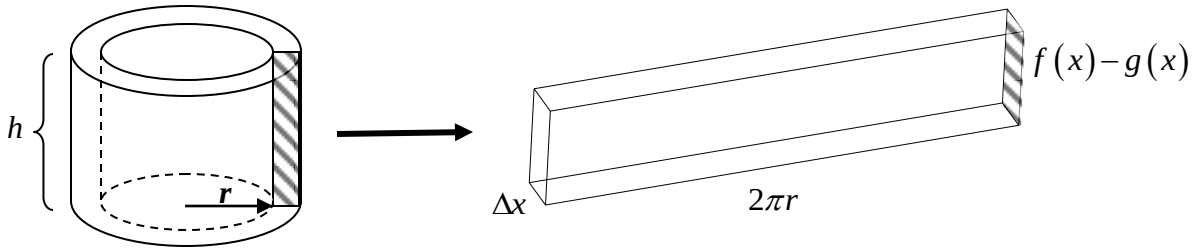
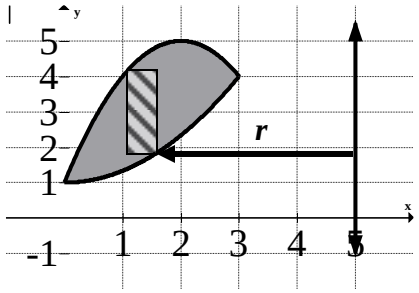
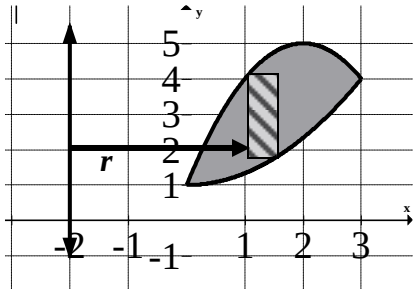
Volume of Revolution: Cylindrical Shells Method

$$V=\int_{x_1}^{x_2} 2\pi\cdot\text{radius}\cdot\text{height}\cdot dx \quad \textbf{or} \quad V=\int_{y_1}^{y_2} 2\pi\cdot\text{radius}\cdot\text{height}\cdot dy$$



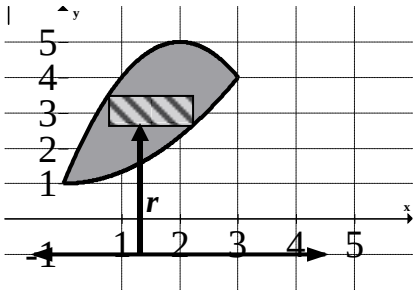


Vertical Axis of Revolution

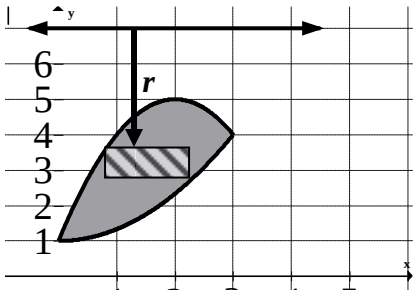


$$V=\int_{x_1}^{x_2} 2\pi\underbrace{(c-x)}_{\text{radius}}\underbrace{\big(f(x)-g(x)\big)}_{\text{height}}dx$$

$$V=\int_{x_1}^{x_2} 2\pi\underbrace{(x-c)}_{\text{radius}}\underbrace{\big(f(x)-g(x)\big)}_{\text{height}}dx$$



Horizontal Axis of Revolution



$$V=\int_{y_1}^{y_2} 2\pi\underbrace{(y-c)}_{\text{radius}}\underbrace{\big(f(y)-g(y)\big)}_{\text{height}}dy$$

$$V=\int_{y_1}^{y_2} 2\pi\underbrace{(c-y)}_{\text{radius}}\underbrace{\big(f(y)-g(y)\big)}_{\text{height}}dy$$