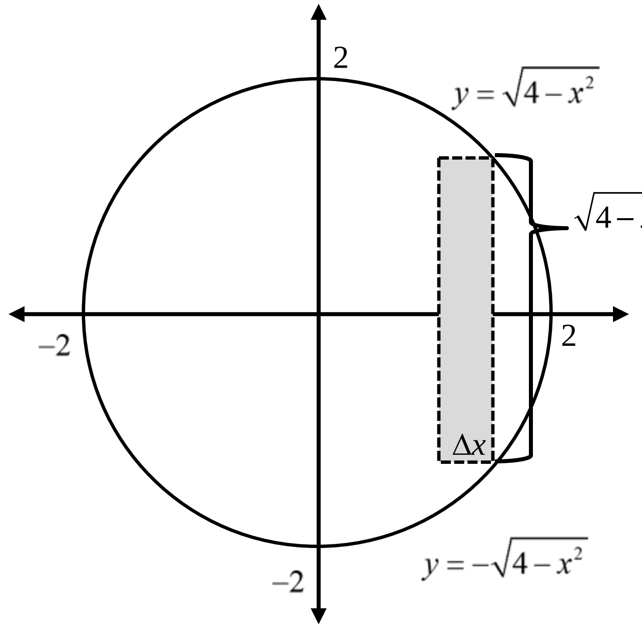
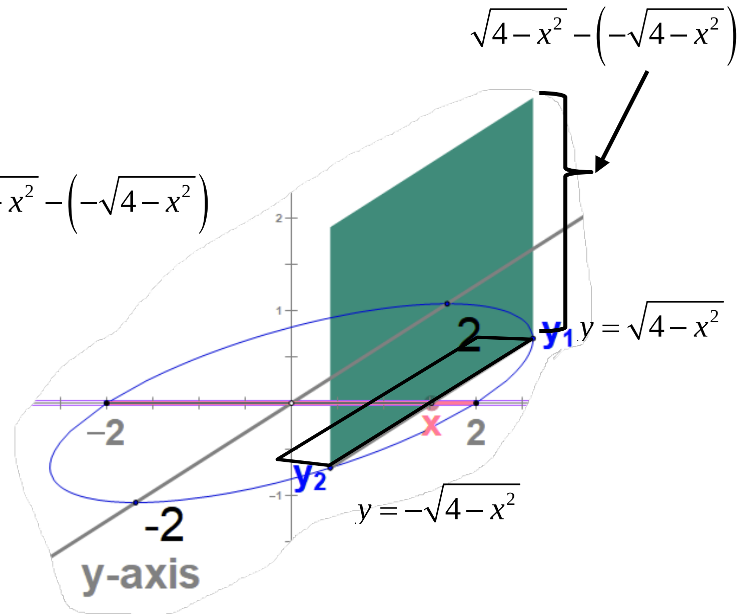
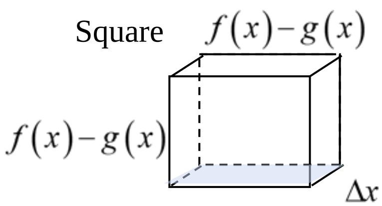
The region in the plane bounded by $x^2 + y^2 = 2^2$ is the base of a solid. For this solid, each cross section perpendicular to the x-axis is a square. Find the volume of the solid.



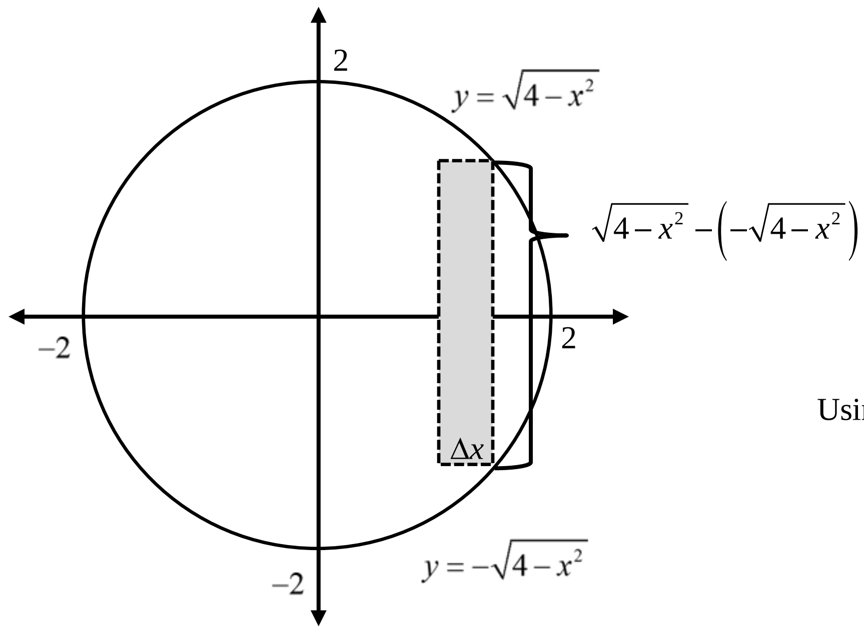


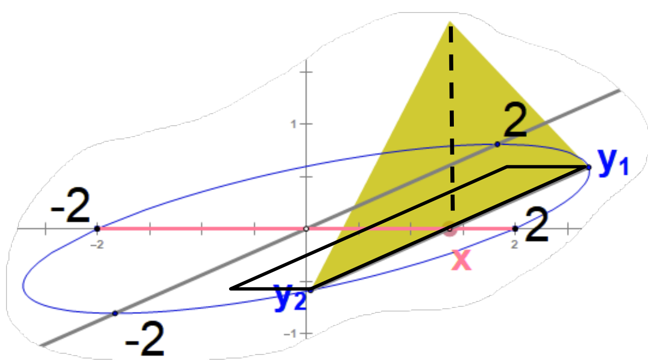


$$V_{\text{slice}} = \left(\sqrt{4-x^2} - \left(-\sqrt{4-x^2}\right)\right)^2 \Delta x$$

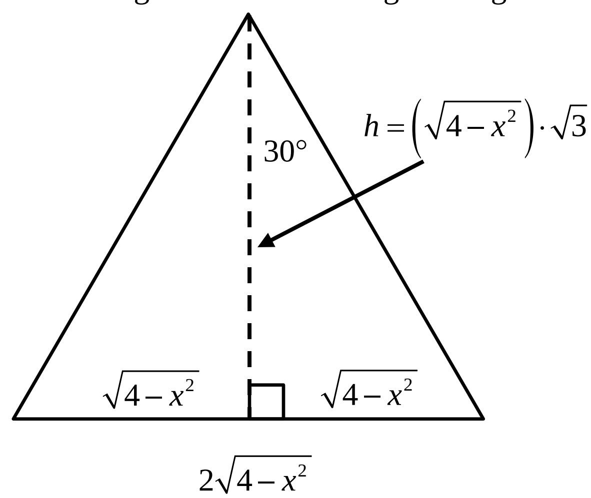
$$V_{\text{solid}} = \int_{-2}^{2} \left(\sqrt{4-x^2} - \left(-\sqrt{4-x^2}\right)\right)^2 dx$$

The region in the plane bounded by $x^2 + y^2 = 2^2$ is the base of a solid. For this solid, each cross section perpendicular to the *x*-axis is an equilateral triangle. Find the volume of the solid.

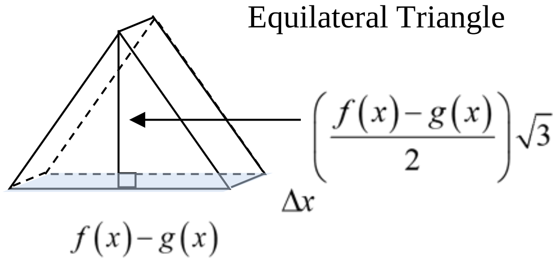




Using $30°-60°-90°$ right triangles



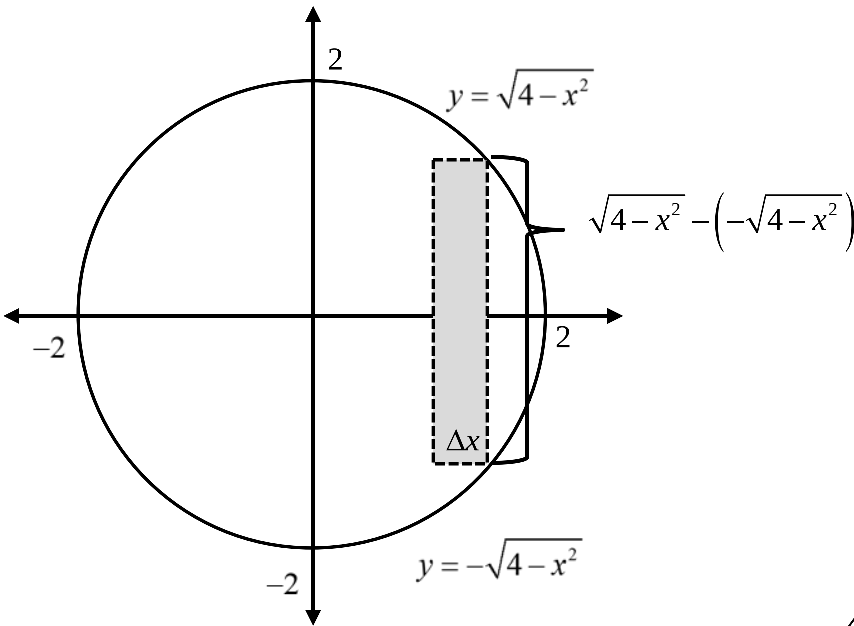
Equilateral Triangle

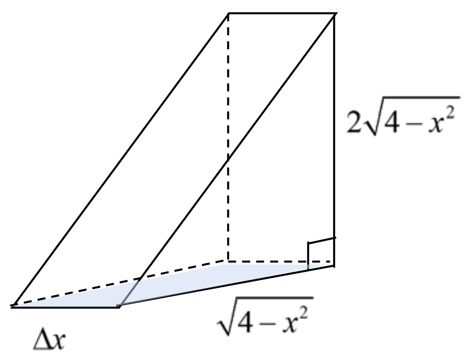


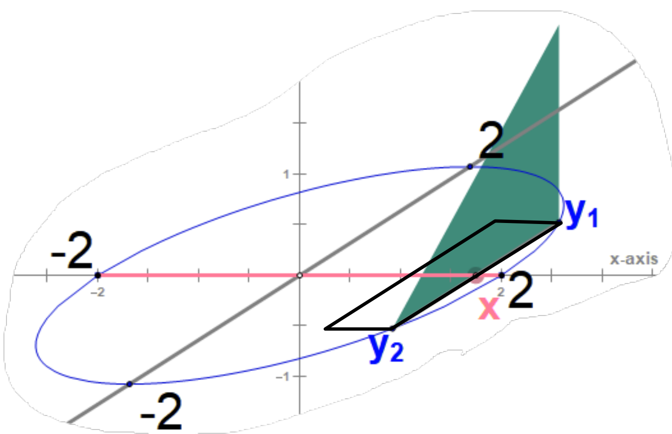
$$V_{\text{slice}} = \frac{1}{2}\left(2\sqrt{4-x^2}\right)\left(\frac{2\sqrt{4-x^2}}{2}\right)\sqrt{3}\cdot\Delta x$$

$$V_{\text{solid}} = \int_{-2}^{2}\frac{1}{2}\left(2\sqrt{4-x^2}\right)\left(\frac{2\sqrt{4-x^2}}{2}\right)\sqrt{3}\sqrt{3}dx$$

The region in the plane bounded by $x^2 + y^2 = 2^2$ is the base of a solid. For this solid, each cross section perpendicular to the *x*-axis is an isosceles right triangle whose leg is in the plane. Find the volume of the solid.



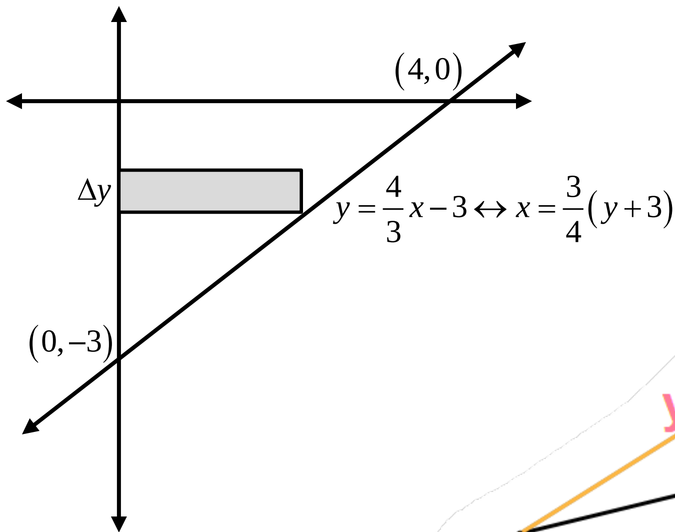


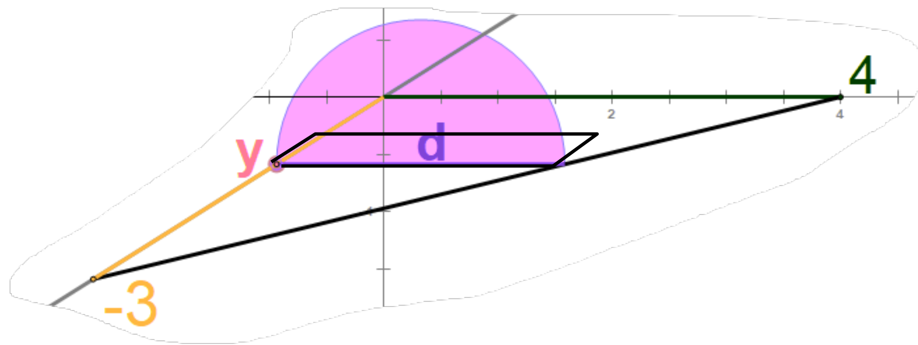


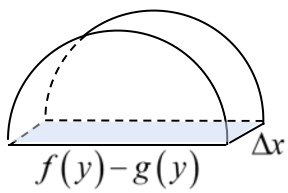
$$V_{\text{slice}} = \frac{1}{2}\left(2\sqrt{4 - x^2}\right)^2 \Delta x$$

$$V_{\text{solid}} = \int_{-2}^{2} \frac{1}{2}\left(2\sqrt{4 - x^2}\right)^2 dx$$

The region in the plane bounded by the x-axis, y-axis, and the line $y=\frac{4}{3}x-3$ is the base of a solid. Cross sections perpendicular to the y-axis are semicircles. Find the volume of the solid.







$$V_{\text{slice}}=\frac{1}{2}\pi\left(\frac{\left[\frac{3}{4}(y+3)\right]}{2}\right)^2\Delta y$$

$$V_{\text{solid}}=\int_{-3}^{0}\frac{1}{2}\pi\left(\frac{\left[\frac{3}{4}(y+3)\right]}{2}\right)^2 dx$$