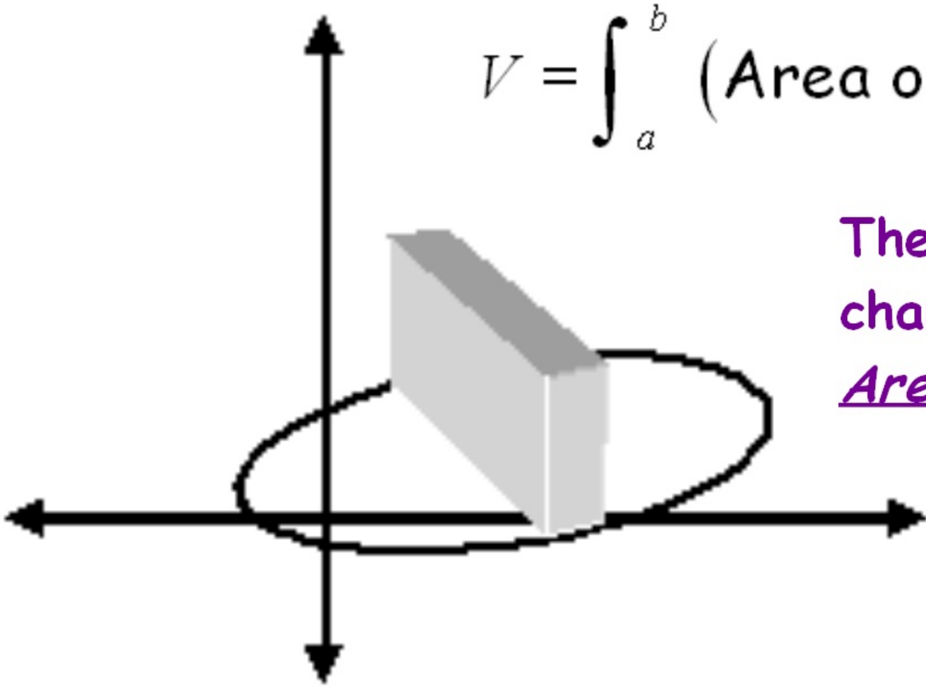
Sec 7.3:
Finding Volumes
Of
Known Cross Sections (Slabs)

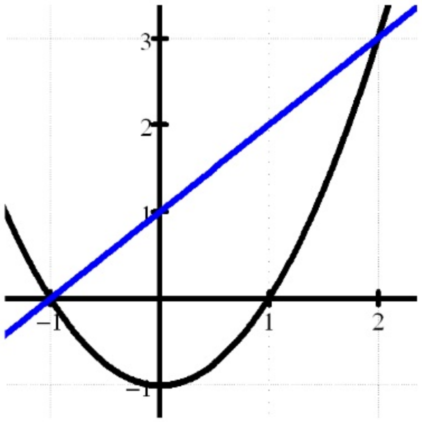
Remember Volume is just *Integrating Area* !

$$V = \int_a^b \left(\text{Area of Cross Section}\right) dx$$



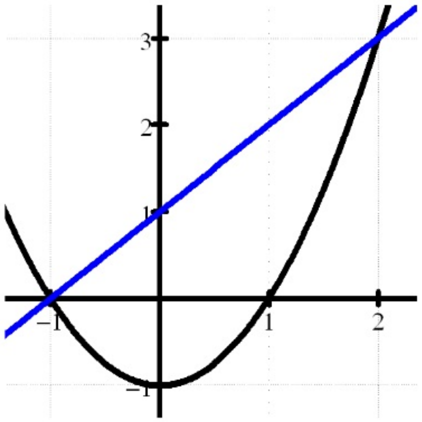
The only thing that ever really changes in a volume problem is the ***Area Formula***.

Consider a region R bounded below by the curve $f(x) = x^2 - 1$ and above by the curve $g(x) = x + 1$



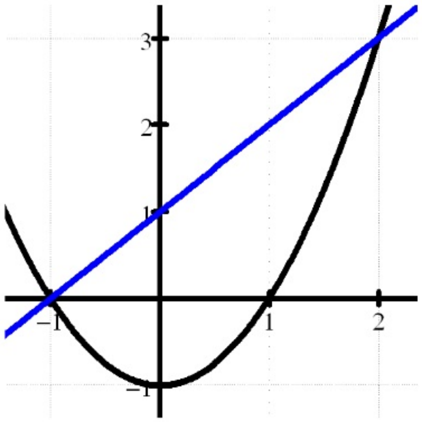
Find the area of R.

Consider a region R bounded below by the curve $f(x) = x^2 - 1$ and above by the curve $g(x) = x + 1$



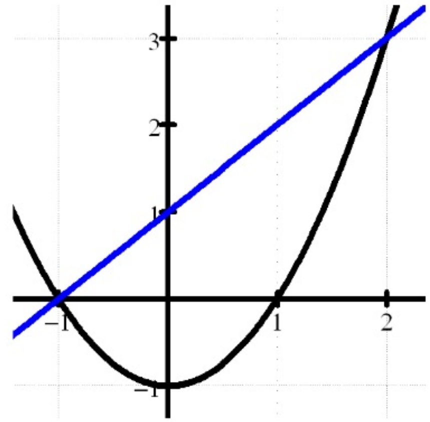
Find the volume of the solid formed by square cross sections perpendicular to the x-axis.

Consider a region R bounded below by the curve $f(x) = x^2 - 1$ and above by the curve $g(x) = x + 1$



Find the volume of the solid formed by semi-circular cross sections perpendicular to the x-axis.

Consider a region R bounded below by the curve $f(x) = x^2 - 1$ and above by the curve $g(x) = x + 1$



Find the volume of the solid formed by isosceles right triangle cross sections perpendicular to the x-axis with one leg in the base.

Consider a region S bounded by $y = e^x$ and $y = x + 2$. The region is the base of a solid.

Set up, but do not evaluate, an integral to find the volume of this solid if the cross sections are squares perpendicular to the y-axis.

Consider a region S bounded by $y = e^x$ and $y = x + 2$. The region is the base of a solid.

Set up, but do not evaluate, an integral to find the volume of this solid if the cross sections are equilateral triangles perpendicular to the x-axis.

Consider a region S bounded by $y = e^x$ and $y = x + 2$. The region is the base of a solid.

Set up, but do not evaluate, an integral to find the volume of this solid if the cross sections are isosceles right triangles with hypotenuse in the xy-plane perpendicular to the y-axis.

Consider a region S bounded by $y = e^x$ and $y = x + 2$. The region is the base of a solid.

Set up, but do not evaluate, an integral to find the volume of this solid if the cross sections are ractangles perpendicular to the x-axis such that the height of the rectangle is three times the length of its base.