

Math 1432

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Office Hours:

Mondays 1-2pm,
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(also available by appointment)

Class webpage:

<http://www.math.uh.edu/~bekki/Math1432.html>

Volumes of Known Cross Sections

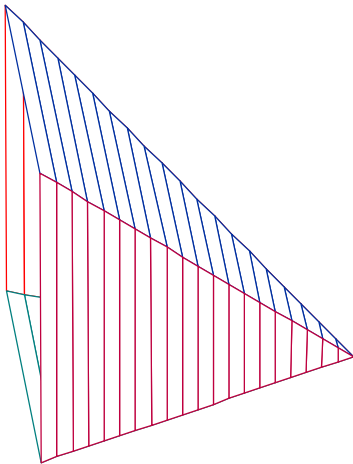
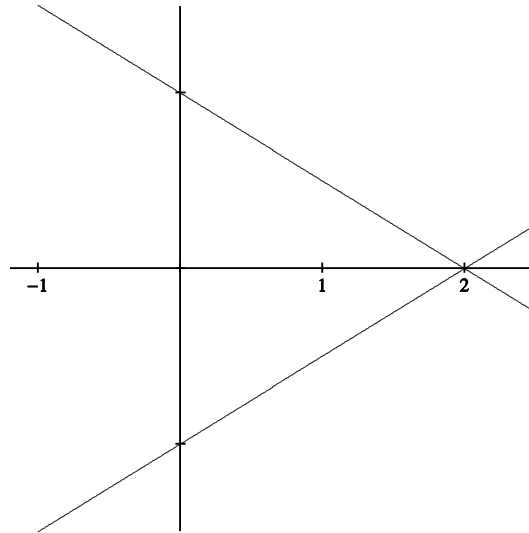
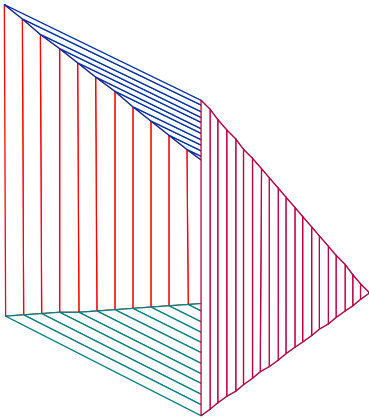
* If the cross section is perpendicular to the x -axis and its area is a function of x , say $A(x)$, then the volume of the solid from a to b is given

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

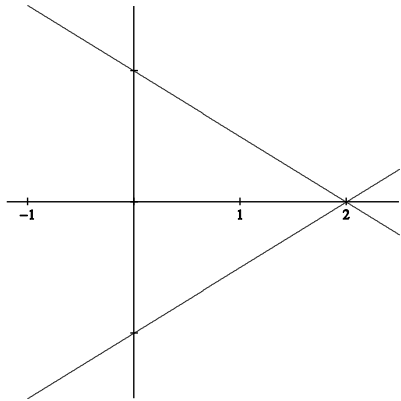
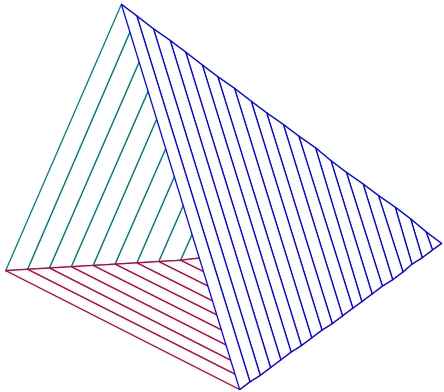
* If the cross section is perpendicular to the y -axis and its area is a function of y , say $A(y)$, then the volume of the solid from c to d is given

by
$$V = \int_c^d A(y) dy$$

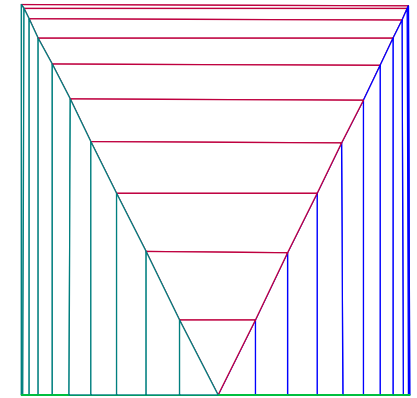
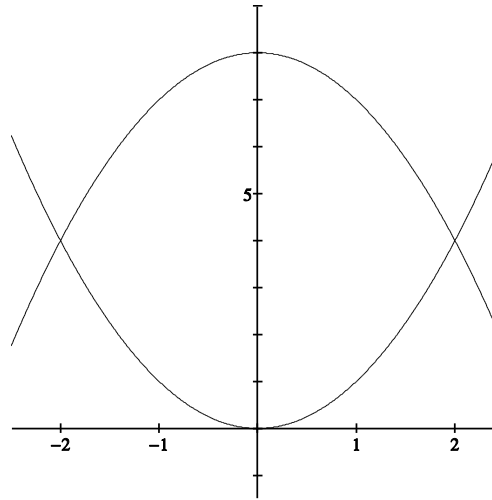
1. Find the volume of the solid whose base is bounded by $f(x) = 1 - \frac{1}{2}x$, $g(x) = -1 + \frac{1}{2}x$ and $x = 0$ if the solid is formed by squares perpendicular to the x-axis.



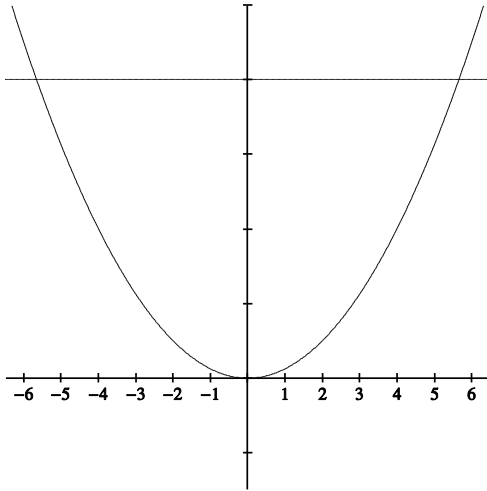
2. Find the volume of the solid whose base is bounded by $f(x) = 1 - \frac{1}{2}x$, $g(x) = -1 + \frac{1}{2}x$ and $x = 0$ if the solid is formed by equilateral triangles perpendicular to the x-axis.



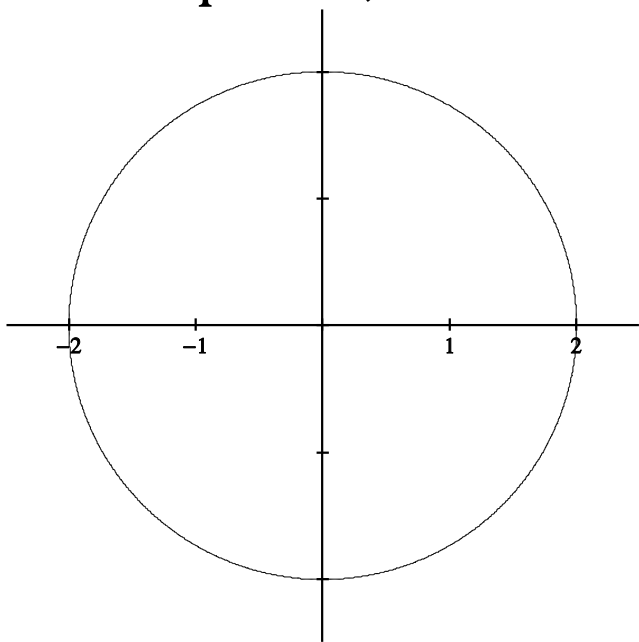
3. Find the volume of the solid whose base is bounded by $f(x) = x^2$, $g(x) = 8 - x^2$ and the solid is formed by squares perpendicular to the x-axis.



4. Find the volume of the solid whose base is bounded by $y = \frac{1}{8}x^2$ and $y = 4$ if the solid is formed by semicircles perpendicular to the y -axis.

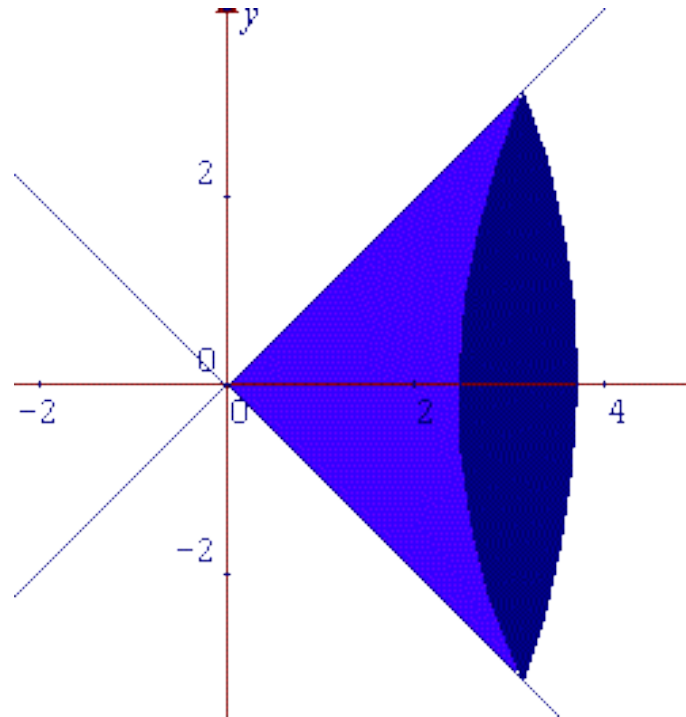
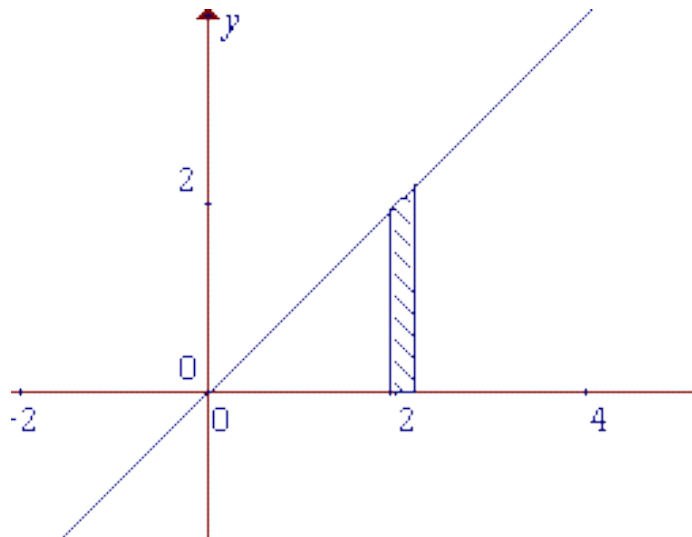


5. Consider a solid whose base is the region inside the circle $x^2 + y^2 = 4$. If cross sections taken perpendicular to the x-axis are squares, find the volume of this solid.

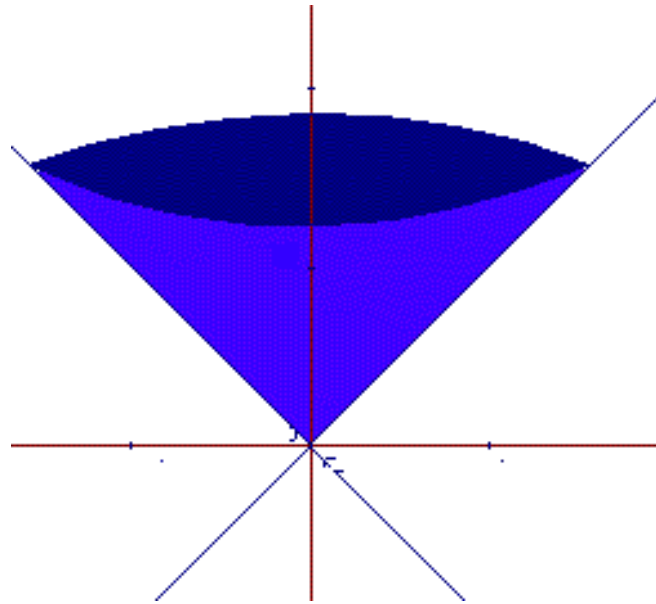
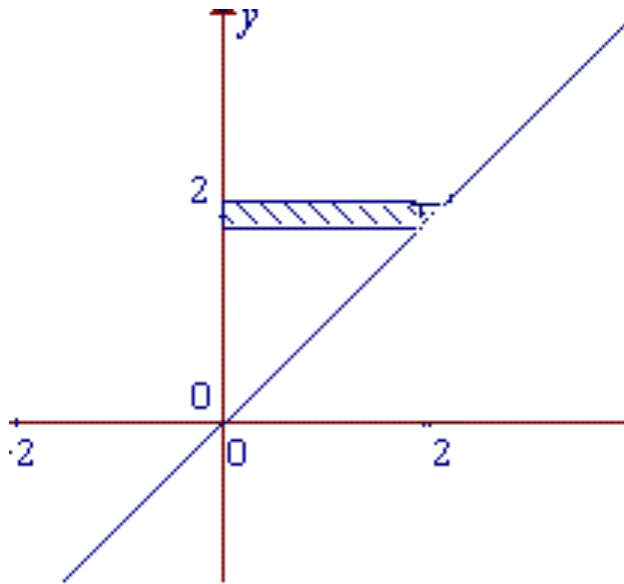


Volume with the Disc Method:

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



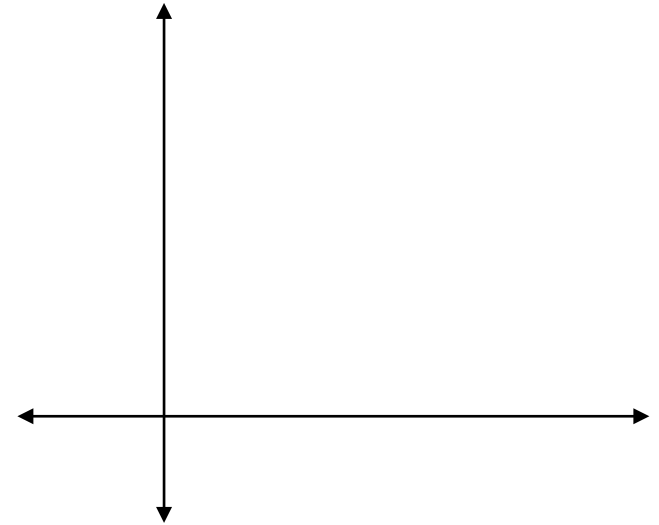
Revolving about the y-axis: $V = \int_c^d \pi [g(y)]^2 dy$



Let R be the region bounded by the x -axis and the graphs of $y = \sqrt{x}$ and $x = 4$. Sketch and shade the region R . Label points on the x and y -axis.

a. Give the formula the area of region R

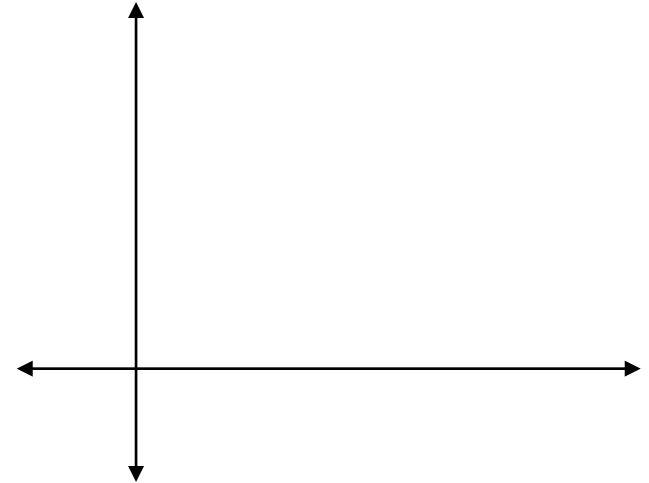
b. Find the area of region R



c. Give the formula the volume of the solid generated when the region R is rotated about the x -axis.

d. Find the volume for the solid in (c).

Let R be the region bounded by the y -axis and the graphs of $y = \sqrt{x}$ and $y = 2$. Sketch and shade the region R . Label points on the x and y -axis.



Give the formula the volume of the solid generated when the region R is rotated about the y -axis.

Find the volume for the solid.