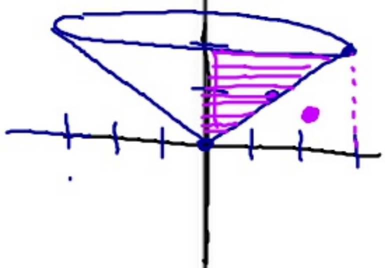
$A = -.725444$ $B = 1.2237831$ Bases Between curves diameter between curves	Let R be the region in quadrant I and II enclosed by the graphs of $y = 2 + \sin(x)$, $y = \sec(x)$ a) Find the volume of a solid whose base is R and whose cross sections cut by planes perpendicular to the x-axis are squares. $\int_A^B (2+\sin x-\sec x)^2\,dx$ b) Find the volume of a solid whose base is R and whose cross sections cut by planes perpendicular to the x-axis are isosceles right triangles. (base runs between curves) $\int_A^B \frac{1}{2}(2+\sin x-\sec x)^2\,dx$ c) Find the volume of a solid whose base is R and whose cross sections cut by planes perpendicular to the x-axis are circles. $V = \pi\int_A^B \left(\frac{1}{2}(2+\sin x-\sec x)\right)^2$ 1.499 $\cancel{1.499}$ $\cancel{2.998}$ d) Find the volume of a solid whose base is R and whose cross sections cut by planes perpendicular to the x-axis are semi-circles. $V = \frac{1}{2}\pi\int_A^B \left(\frac{1}{2}(2+\sin x-\sec x)\right)^2$ $\cancel{1.499}$

x	y
0	0
1.5	1
3	2

Using geometry, find the volume of the solid generated by revolving the region bounded by the curve $x = \frac{3y}{2}$ and the y-axis about the y-axis from $0 \le y \le 2$.



$$V = \frac{1}{3}\pi r^2 h$$

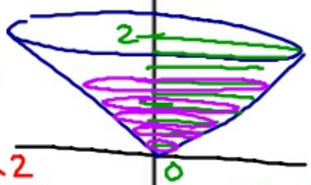
$$V = \frac{1}{3}\pi (3)^2 (2) = 6\pi$$

Using calculus, find the volume of the solid generated by revolving the region bounded by the curve $x = \frac{3y}{2}$ and the y-axis about the y-axis from $0 \le y \le 2$.

Right - Left

$\frac{3y}{2} - 0$

radius $= \frac{3y}{2}$



$$V = \int_0^2 (\text{Area of a Circle})\, dy$$

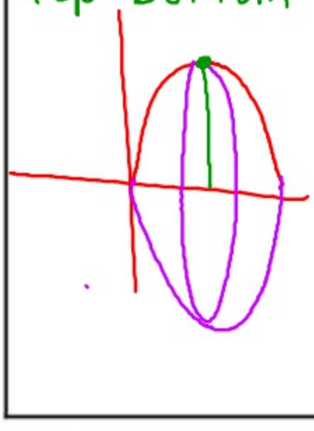
$$V = \pi \int_0^2 (\text{radius})^2\, dy$$

$$V = \pi \int_0^2 \left(\frac{3y}{2}\right)^2 dy$$

$$V = \frac{9\pi}{4} \int_0^2 y^2 = \frac{9\pi}{4}\left[\frac{1}{3}y^3\right]_0^2 =$$

$$= \frac{9\pi}{4} \cdot \frac{8}{3} = 6\pi$$

Top - Bottom



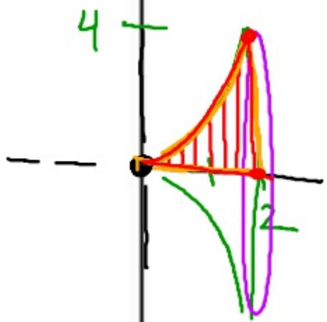
10. Find the volume of the solid generated by revolving the region bounded by the curve **y = sinxcosx** and the x-axis about the x-axis from $0 \le x \le \pi$.

$$V = \pi \int_0^{\pi} (\text{radius})^2\, dx$$

$$V = \pi \int_0^{\pi} (\sin x \cos x)^2\, dx$$

x axis

12. Find the volume of the solid generated by revolving the region bounded by the curve $\mathbf{y = x^2}$ and the lines $y = 0$ and $x = 2$ about the x-axis.



$$V = \pi\int_0^2 (x^2)^2\,dx$$

18. Find the volume of the solid generated by revolving the region bounded by the curve $\mathbf{y = 4 - x^2}$ and the curve $\mathbf{y = 2 - x}$ about the x-axis.

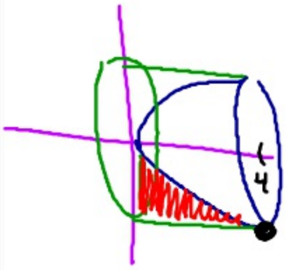
$x = y^2$

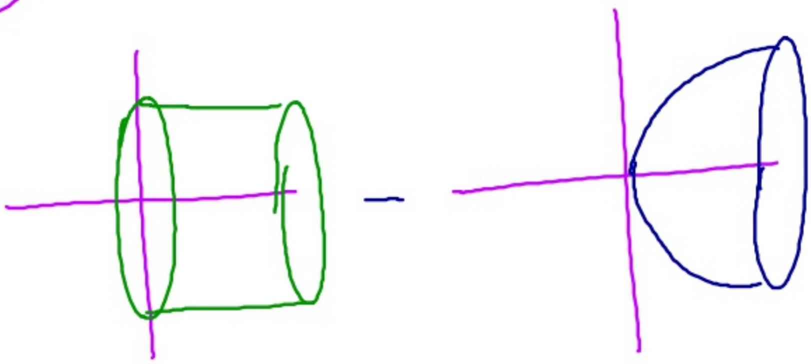
20. Find the volume of the solid generated by revolving the region bounded by the curve $y = -\sqrt{x}$ and the lines x = 0 and y = -2 about the y-axis.

$$V = \pi \int_{-2}^{0} (y^2)^2 \, dy$$

(radius)

20. Find the volume of the solid generated by revolving the region bounded by the curve $y = -\sqrt{x}$ and the lines x = 0 and y = -2 about the x-axis.





	21. Find the volume of the solid generated by revolving the region in the first quadrant bounded above by the line $y = \sqrt{2}$, below by the curve **y = secxtanx,** and on the left by the y -axis, about the line $y = \sqrt{2}$. 30a. Find the volume of the solid generated by revolving the triangular region bounded by the lines y = 2x, y = 0 about the line x = 1.

	31b. Find the volume of the solid generated by revolving the triangular region bounded by the curve $y = x^2$ and the line y =1 about the line y = 2. 29d. Find the volume of the solid generated by revolving the triangular region bounded by the curve $y = \sqrt{x}$ and the lines y =2 and x = 0 about the line x = 4.