

Math 181 Friday, February 5

Section 6.4

6.3.5 $y = 2^2/x^2, y = 2^2 + 1 - x^2$

Mon - 6.5

About $y = 81 = 4/x^2$

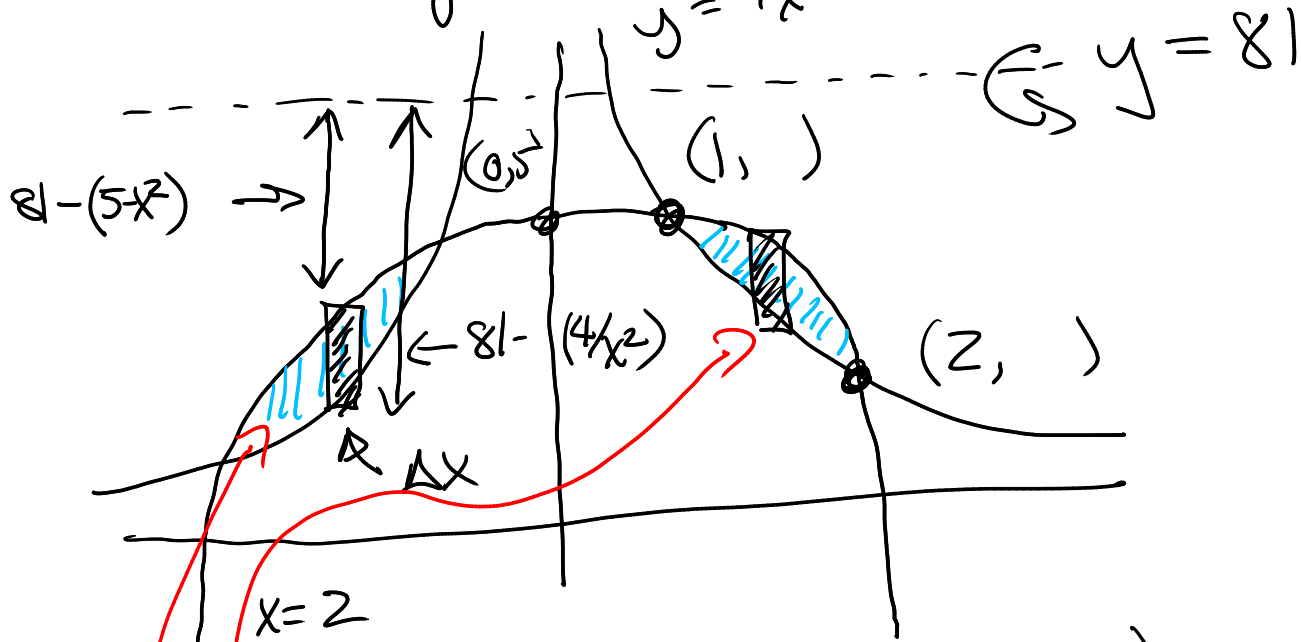
Tue - 7.1

Thu - 7.1

Fri - 7.2

Mon - Review

Tue - Exam 1
Chapters 5 & 6

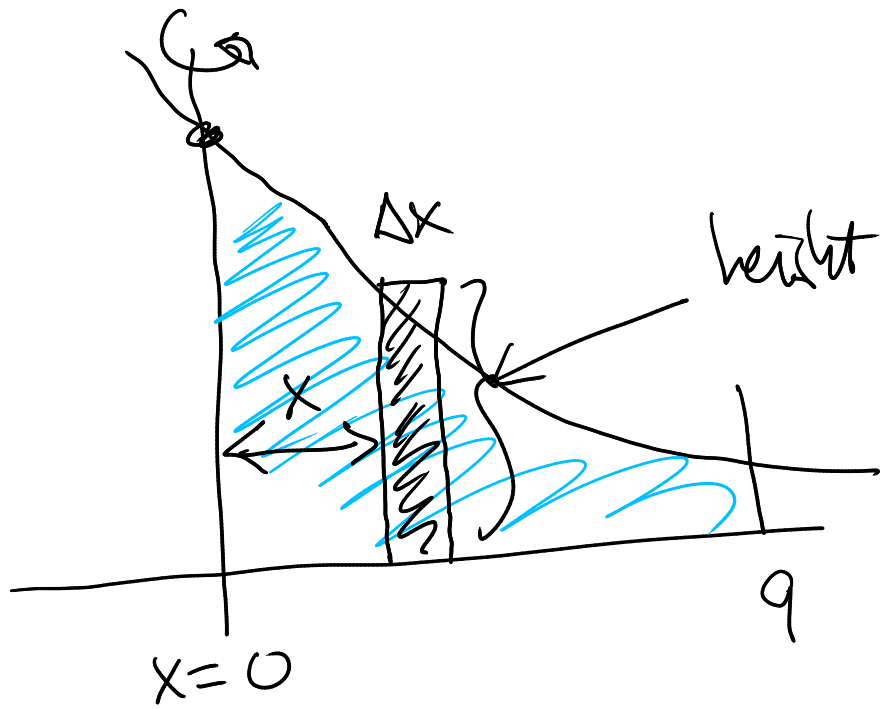


$$2 \int_{x=1}^{x=2} \pi \left((81 - 4/x^2)^2 - (81 - (5-x^2))^2 \right) dx$$

$$\begin{aligned} 4/x^2 &= 5 - x^2 \\ 4 &= 5x^2 - x^4 \\ x^4 - 5x^2 + 4 &= 0 & x = \pm 2, \pm 1 \\ (x^2 - 4)(x^2 - 1) &= 0 \end{aligned}$$

Review WW 6.4- preview. 3

$y = \frac{1}{\sqrt{x^2+6}}$ on $[0, 9]$, $x=0$ about shells



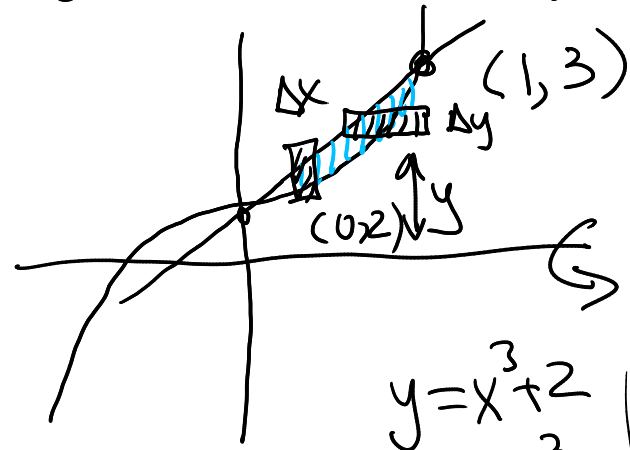
$\int_{x=0}^{x=9} 2\pi x \frac{1}{\sqrt{x^2+6}} dx$
 $\pi R^2 - \pi r^2$

The diagrams illustrate the shell method. On the left, a circular cross-section of a shell is shown with a central hole, labeled with the formula $\pi R^2 - \pi r^2$. On the right, a 3D perspective of a cylindrical shell is shown with a red arrow indicating the direction of integration along the x-axis, labeled dx .

$y = \frac{1}{\sqrt{x^2+6}} \approx \frac{1}{\sqrt{x^2}} = \frac{1}{x}$

24 Region bounded by $y = x^3 + 2$ & $y = x + 2$ in 1st quadrant

Rotate around x-axis



$$y = x^3 + 2$$

$$y - 2 = x^3$$

$$(y - 2)^{1/3} = x$$

$$y = x + 2$$

$$y - 2 = x$$

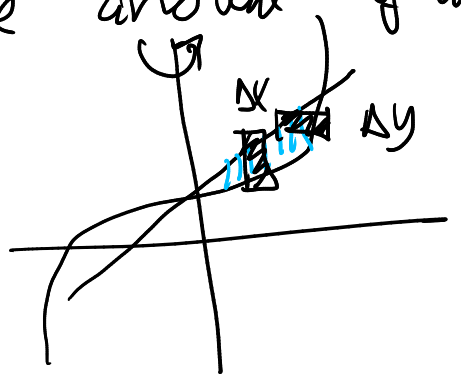
$\Delta x \Rightarrow$ washers

$$\int_{x=0}^{x=1} \pi \left((x+2)^2 - (x^3+2)^2 \right) dx$$

$\Delta y \Rightarrow$ shells

$$\int_{y=2}^{y=3} 2\pi y \left((y-2)^{1/3} - (y-2) \right) dy$$

Rotate around y-axis



$\Delta x \Rightarrow$ shells

$$\int_{x=0}^{x=1} 2\pi x \left((x+2) - (x^3+2) \right) dx$$

$\Delta y \Rightarrow$ washers

$$\int_{y=2}^{y=3} \pi \left(\left((y-2)^{1/3} \right)^2 - (y-2)^2 \right) dy$$