

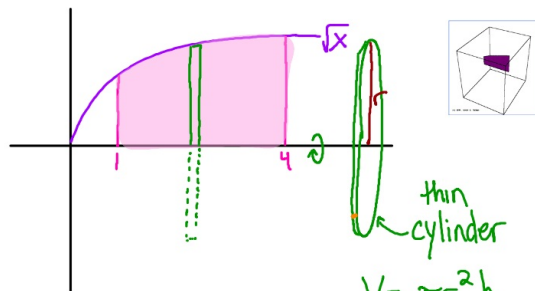
# November 26

## SWBAT:

### Find the volume using the disk method



Find the volume of the solid generated by revolving the region bounded by  $y = \sqrt{x}$ ,  $x = 1$  and  $x = 4$  about the  $x$ -axis



$$V = \pi r^2 h$$

$$r = \sqrt{x}$$

$$h = dx$$

$$V_{\text{slice}} = \pi (\sqrt{x})^2 dx$$

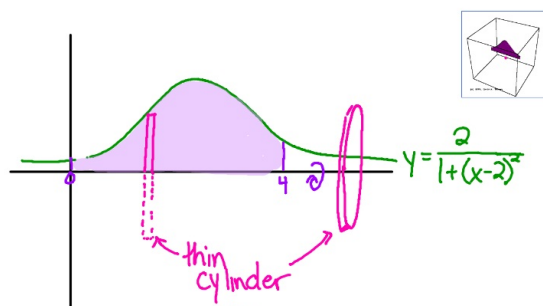
$$V_{\text{slice}} = \pi (x) dx$$

$$\begin{aligned} V_{\text{total}} &= \int_1^4 \pi x dx = \pi \int_1^4 x dx \\ &= \pi \left( \frac{x^2}{2} \Big|_1^4 \right) = \pi \left( \frac{4^2}{2} - \frac{1^2}{2} \right) \\ &= \frac{15\pi}{2} \end{aligned}$$

Find the volume of the solid generated by revolving the region bounded by

$$y = \frac{2}{1+(x-2)^2}$$

$x = 0$  and  $x = 4$   
about the  $x$ -axis



$$V = \pi r^2 h$$

$$r = \frac{2}{1+(x-2)^2}$$

$$h = dx$$

$$V_{\text{slice}} = \pi \left( \frac{2}{1+(x-2)^2} \right)^2 dx$$

$$\begin{aligned} V_{\text{total}} &= \pi \int_0^4 \left( \frac{2}{1+(x-2)^2} \right)^2 dx \\ &= 6.0285 \pi \\ &= 18.939 \end{aligned}$$

Disk  
Method  
(Volumes  
of  
Revolution)

Slices are perpendicular  
(perpendiskular)  
to the axis of rotation

$$V = \pi \int_a^b r^2 dx$$