

February 25

How can you find the volume of a
right circular cylinder?
(a can)

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



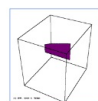
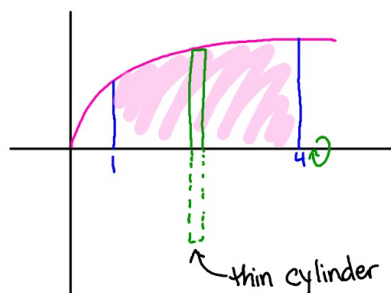
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Students will verbally explain how to
find the volume using the disk
method.

(using the words:
limit, expand, simplify...)



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



$$r = \sqrt{x}$$

$$A = \pi r^2 = \pi (\sqrt{x})^2$$

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

$$V_{\text{total}} = \int_1^4 \pi (\sqrt{x})^2 dx$$

$$= \pi \int_1^4 x dx$$

$$= \pi \left(\frac{x^2}{2} \Big|_1^4 \right)$$

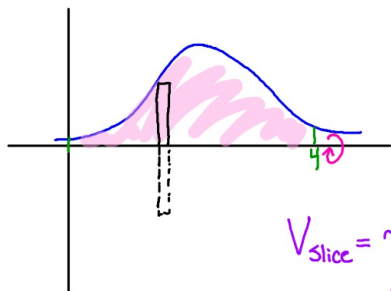
$$= \pi \left(\frac{4^2}{2} - \frac{1^2}{2} \right)$$

$$= \pi \left(\frac{16}{2} - \frac{1}{2} \right) = \frac{15\pi}{2}$$

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



$$V_{\text{slice}} = \pi r^2 h$$

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

$$h = dx$$

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

$$V_{\text{total}} = \int_0^4 \pi \left(\frac{2}{1+(x-2)^2} \right)^2 dx$$

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

Volume of Revolution

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

function to
axis of rotation

$dx = \text{height}$

Find the volume
of the solid generated
by revolving the
region bounded by
 $y = \sin(x) + 4$
 $x = 1$ and $x = 4$
about the x -axis

