

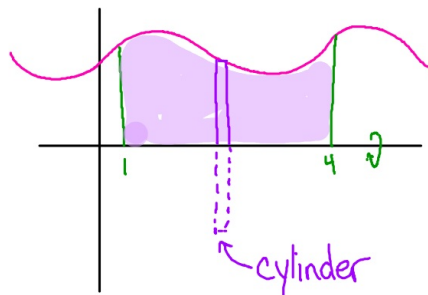
November 27

SWBAT:

Find the volume using the disk method



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



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

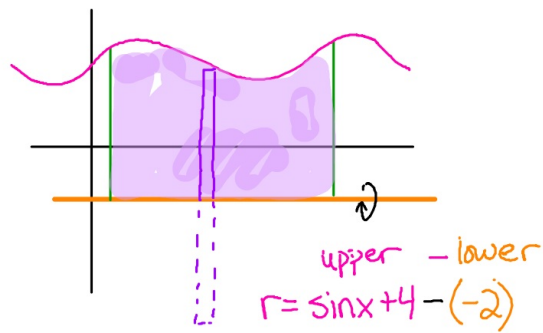
$$r = \sin x + 4$$

$$h = dx$$

$$V_{\text{slice}} = \pi (\sin x + 4)^2 dx$$

$$V_{\text{total}} = \pi \int_1^4 (\sin x + 4)^2 dx$$
$$= 185.453$$

Find the volume of the solid generated by revolving the region bounded by $y = \sin(x) + 4$, $y = -2$, $x = 1$ and $x = 4$ about the line $y = -2$



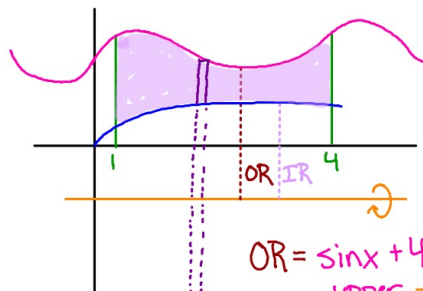
$$r = \sin x + 4 + 2$$

$$r = \sin x + 6$$

$$h = dx$$

$$V = \pi \int_1^4 (\sin x + 6)^2 dx = 388.952$$

Find the volume of the solid generated by revolving the region bounded by $y = \sin(x) + 4$, $y = \sqrt{x}$, $x = 1$ and $x = 4$ about the line $y = -2$



$$IR = \sqrt{x} - (-2)$$

upper - lower

$$V = \pi \int_1^4 (\sin x + 6)^2 dx - \pi \int_1^4 (\sqrt{x} + 2)^2 dx$$

$$= \pi \int_1^4 (\sin x + 6)^2 - (\sqrt{x} + 2)^2 dx$$

$$= 269.048$$

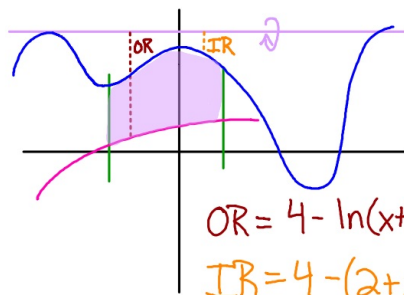
Disk Method

$$V = \pi \int_a^b (OR)^2 - (IR)^2 dx$$

OR = Outside Radius
from the axis of rotation
to the function farthest away
upper - lower

IR = Inside Radius
from the axis of rotation
to the close function
upper - lower

Find the volume
of the solid generated
by revolving the
region bounded by
 $y = 2 + x(\cos(x))$
 $y = \ln(x + 3)$
 $x = -2$ and $x = 1$
about the ~~x-axis~~
line $y = 4$



$$OR = 4 - \ln(x+3)$$

$$IR = 4 - (2 + x\cos x)$$

$$V = \pi \int_{-2}^1 (4 - \ln(x+3))^2 - (4 - (2 + x\cos x))^2 dx$$

$$= 55.393$$