9.3 Disk Method dx

Wednesday, June 12, 2019 7:14 AM

AREA

|||| dx ≡ dy

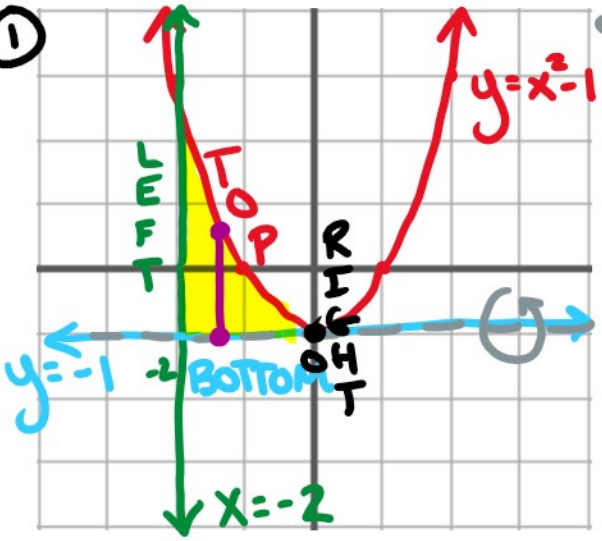
VOLUME

DISK dx/dy WASHER dx/dy SHELL dx/dy

ex Find the volume of the solid generated by revolving the region bounded by $y=x^2-1$, $x=-2$, and $y=-1$ about the line $y=-1$.

↑ Axis of Rotation

↑ Borders of region

① 

② DISK WASHER SHELL

↑

A.R. is a border of the region

dx dy

↑

A.R. is a horizontal line

③ Disk dx: $V=\pi\int_L^R (T-B)^2\,dx$

$V=\pi\int_{-2}^{0}[(x^2-1)-(-1)]^2\,dx$ ④ $= 6.4\pi \approx 20.11$