

AREA

TOP
||||
BOTTOM

$$\int_L^R (T-B) dx$$

TOP
||||
BOTTOM

LEFT
====
RIGHT
====
TOP
====
BOTTOM

$$\int_B^T (R-L) dy$$

VOLUME

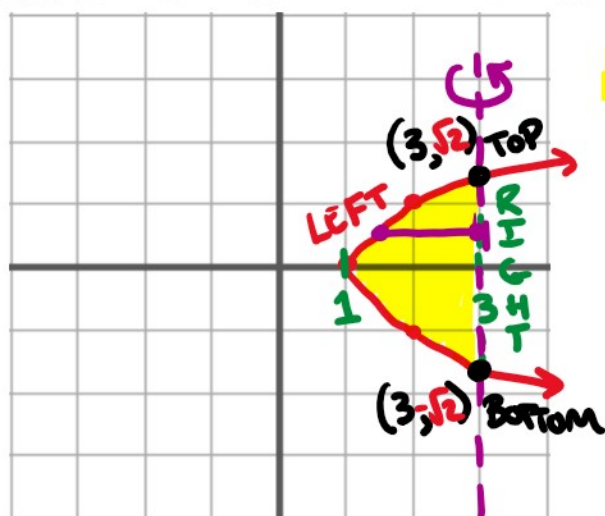
DISK METHOD ← A.R. is a border of region
A.R. is horizontal (x-axis)

$$\pi \int_L^R (T-B)^2 dx$$

← A.R. is vertical (y-axis)

$$\pi \int_B^T (R-L)^2 dy$$

must be in terms of y (no x's)



$x = y^2 + 1$ $1 \leq x \leq 3$ A.R. $x = 3$
(BORDER → DISK)
 $y = \pm \sqrt{x-1} = \pm \sqrt{3-1} = \pm \sqrt{2}$ (VERTICAL → dy)

$$V = \pi \int_B^T (R-L)^2 dy$$

$$V = \pi \int_{-\sqrt{2}}^{\sqrt{2}} [3 - (y^2 + 1)]^2 dy$$

$$= 6.03\pi \text{ or } 18.96$$