

MON 4-3-06

AP BUFF

②④ C

②⑥ B

②⑧ E

②⑤ E

②⑦ OMIT (SORRY)

7.3 VOLUMES

VOLUME - THE AMOUNT OF
SPACE INSIDE AN OBJECT,
MEASURED IN CUBIC UNITS.

THE BASIC VOLUME FORMULA

$$V = B \cdot h$$

THE
AREA
OF
THE
BASE

height

"VOLUMES BY SLICING"

$$V = ?$$

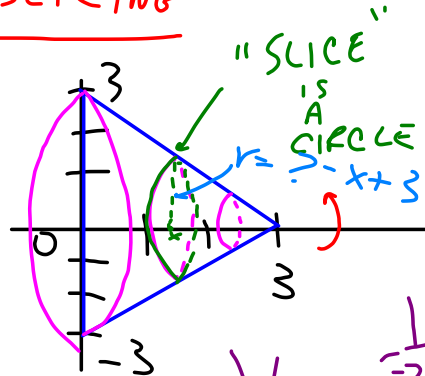
$$A_{\text{slice}} = \pi \cdot r^2$$

$$A_{\text{slice}} = \pi(-x+3)^2$$

$$V = \int_{x=0}^{x=3} \underbrace{\pi \cdot (-x+3)^2}_{A \text{ of SLICE}} \cdot \underbrace{dx}_{\text{THICKNESS}}$$

$$V_{\text{cone}} = \frac{1}{3} \pi r^2 h$$

$$= \frac{1}{3} \pi (3)^2 \cdot 3$$



$$V = \pi \int_{x=0}^{x=3} (x^2 - 6x + 9) dx$$

$$V = \pi \left[\frac{1}{3}x^3 - 3x^2 + 9x \right]_{x=0}^{x=3}$$

$$V = \pi \left[\frac{1}{3} \cdot 3^3 - 3(3)^2 + 9(3) \right] - 0$$

$$V = 9\pi \text{ CU. UNITS}$$

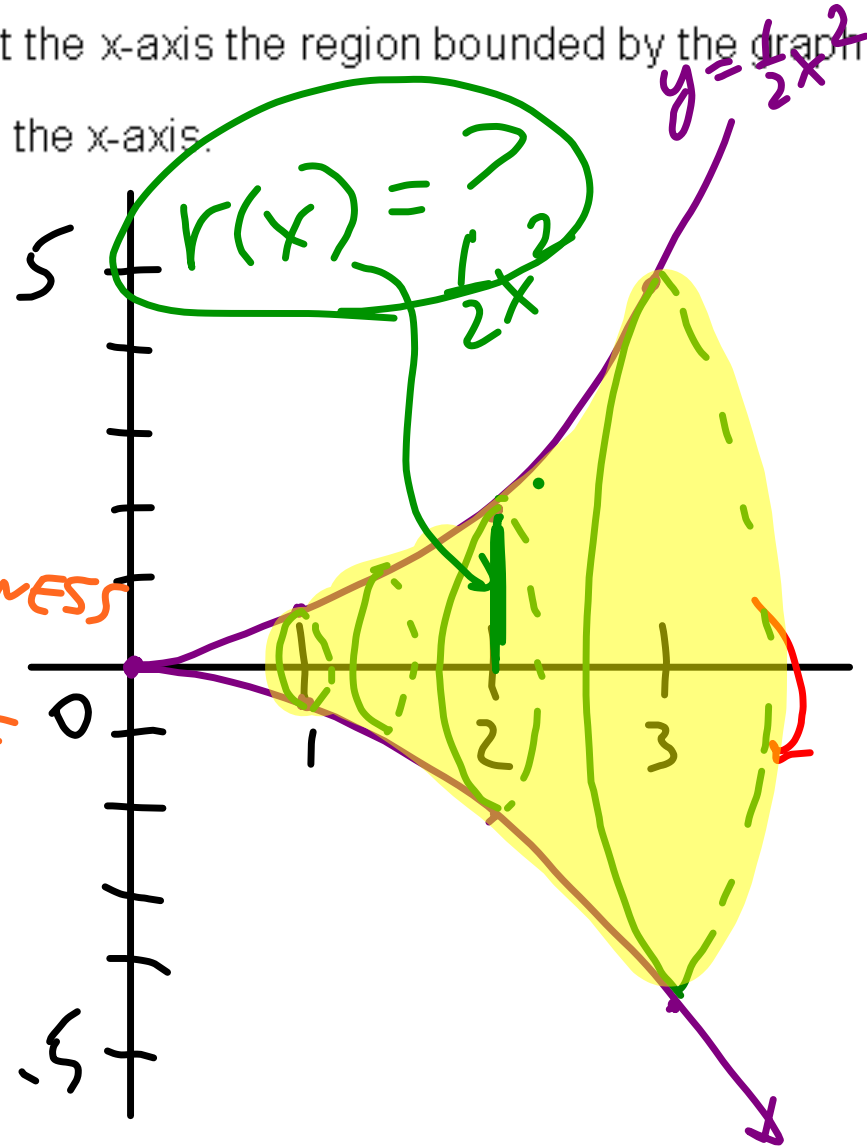
AP CALCULUS GIFT 7.3 VOLUMES OF SOLIDS OF ROTATION (from Faires text)

1. Find the volume generated by rotating about the x-axis the region bounded by the graph of $f(x) = \frac{1}{2}x^2$, the lines $x=1$, $x=3$, and the x-axis.

"TREE STUMP"

$$V = \int_{x=1}^{x=3} \underbrace{\pi \left(\frac{1}{2}x^2 \right)^2}_{\text{AREA OF SLICE}} \cdot \underbrace{dx}_{\text{THICKNESS OF SLICE}}$$

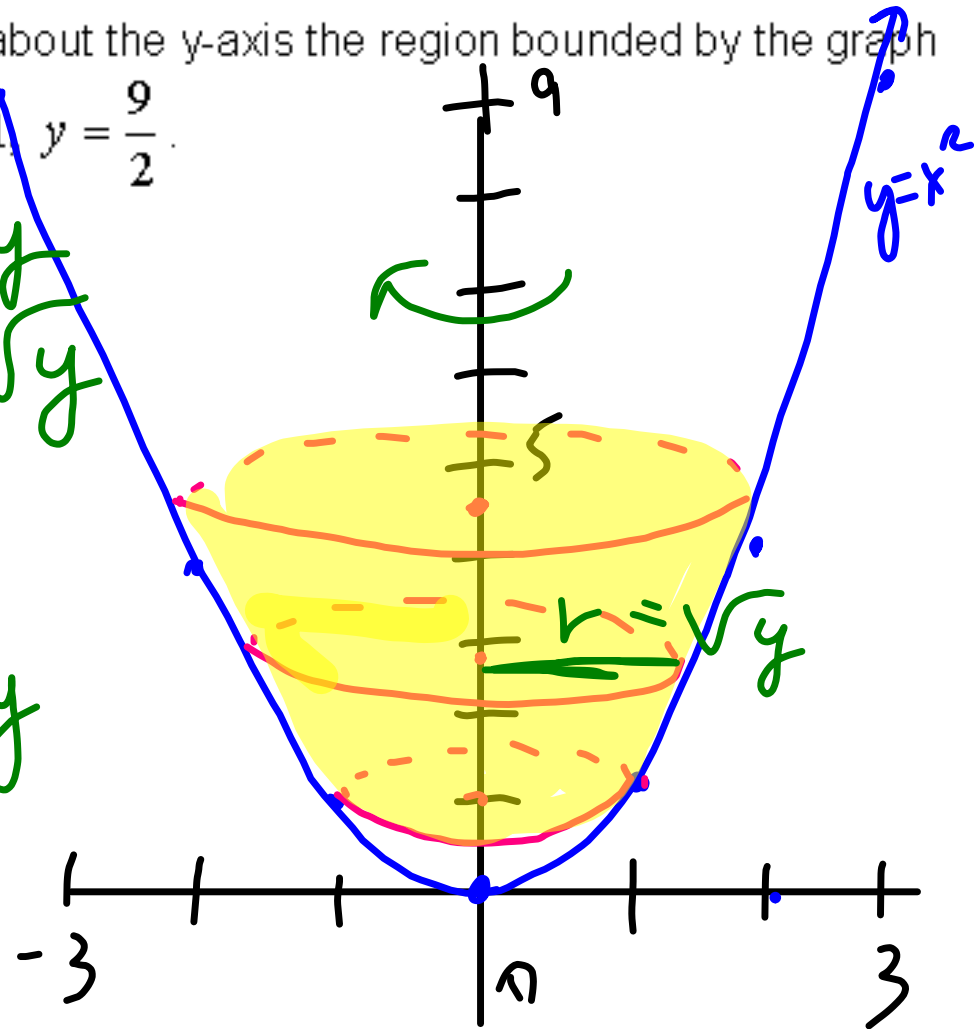
$$V = \frac{121\pi}{10} \text{ CU. UNITS}$$



2. Find the volume generated by rotating about the y-axis the region bounded by the graph of $y = x^2$, the y-axis, and the lines $y = 1$, $y = \frac{9}{2}$.

$$V = \int_{y=1}^{y=\frac{9}{2}} (\sqrt{y})^2 \cdot dy$$

$r = \sqrt{y}$ $x^2 = y$
 $x = \sqrt{y}$



O.T.L.

- CORRECT TESTS

- GIFT 7.3 1-3, 6, 7, 9

- BRING?