Math 141
Quiz 3
September 18, 2015

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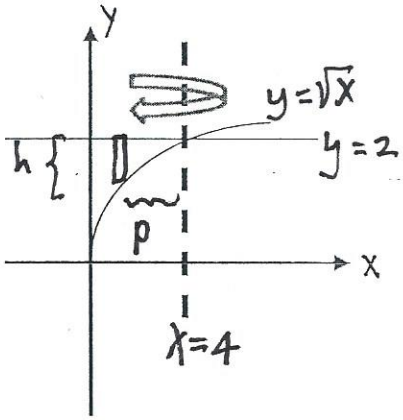
1. *SET UP* the integral to find the volume of the solid generated by rotating the region bounded by the about the *line* $x = 4$ using vertical rectangles. Indicate (circle) the method used.

DISK WASHER $\boxed{\text{SHELL}}$

$y=\sqrt{x},\ x=0,\ y=2$
about $x=4$



$p = 4 - x$

$h = 2 - \sqrt{x}$

$$V = 2\pi \int_0^4 (4-x)(2-\sqrt{x})\,dx$$

2. *SET UP* the integral to find the volume of the solid with ***semi-circular*** cross-sections taken perpendicular to the x-axis whose base is bounded by the graphs of $y = x^2$ and $y = 2x$.

$$V = \int_a^b A(x)\,dx$$

limits:

$x^2 = 2x$

$x^2 - 2x = 0$

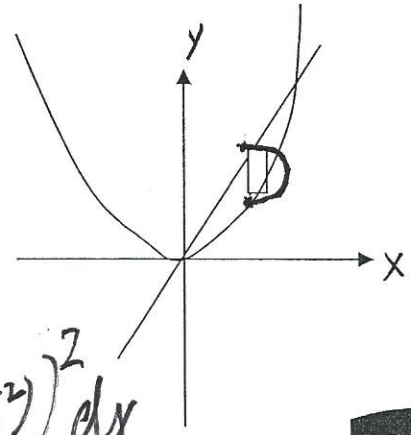
$x(x-2) = 0$

$x = 0, 2$

$A = \frac{1}{2}\pi r^2$

$d = 2x - x^2$

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



$$V = \int_0^2 \frac{1}{2}\pi \left(\frac{1}{2}(2x-x^2)\right)^2 dx$$