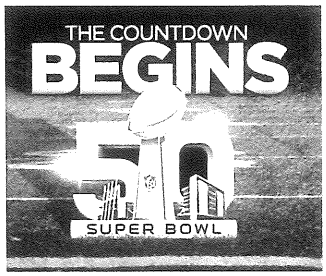
Math 141
Quiz 3-
February 1, 2016



name Pete Zaria

10:10 class
section 1

SET UP the definite integral(s) to find the volume of the solid generated by rotating the region bounded by the graphs of $y = 2x - x^2$, $y = x$ about the x-axis using <u>vertical rectangles</u>.

WASHER

$R(x) = 2x - x^2$

$r(x) = x$

limits:

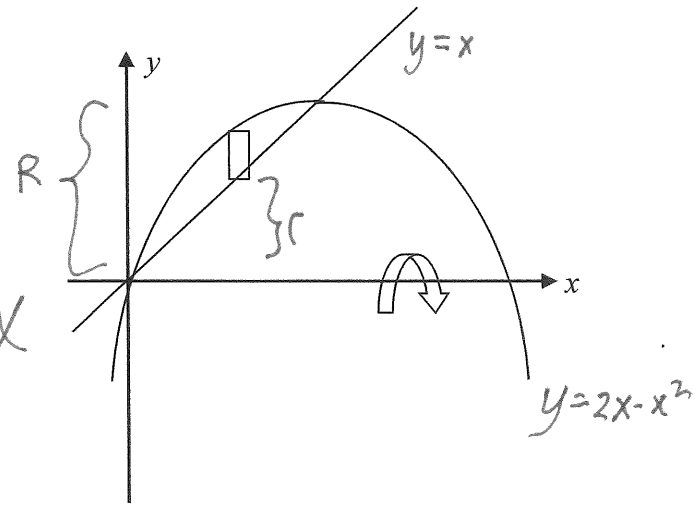
$2x - x^2 = x$

$x^2 - x = 0$

$x(x-1) = 0$

$x = 0, 1$

$$V = \pi \int_0^1 \left[(2x-x^2)^2 - (x)^2\right] dx$$



SET UP the definite integral(s) to find the volume of the solid generated by revolving the region bounded by the graphs of and $x = y^2$ and $x = y + 2$ about the line $y = 2$, using <u>horizontal rectangles</u>.

SHELL

$h(y) = y + 2 - y^2$

$p(y) = 2 - y$

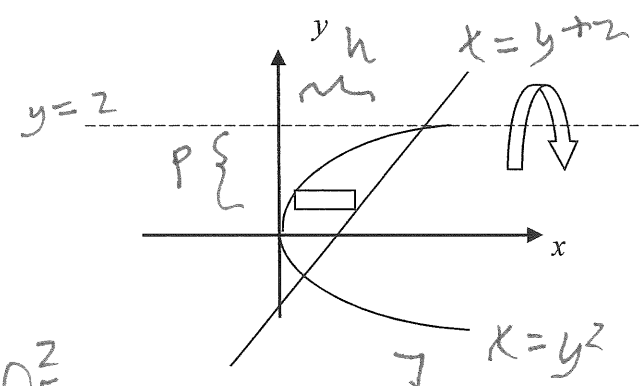
limits: $y + 2 = y^2$

$y^2 - y - 2 = 0$

$(y-2)(y+1) = 0$

$y = 2, -1$

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

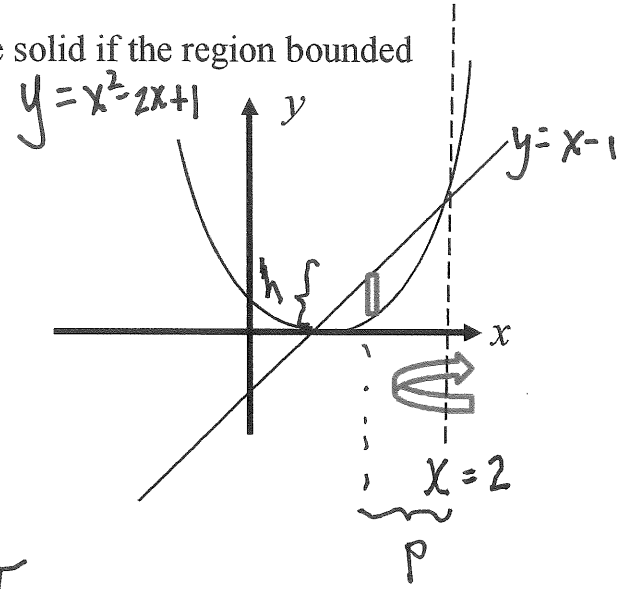


Math 141
Quiz 3
February 2, 2016

11:15 class
section 2

name Pete Zaria

SET UP the definite integral(s) to find the volume of the solid if the region bounded by $y = x - 1$ and $y = x^2 - 2x + 1$ are rotated about the the line $x = 2$ using vertical rectangles.



Shell

$p(x) = 2 - x$

$h(x) = (x-1) - (x^2 - 2x + 1)$

limits:

$x^2 - 2x + 1 = x - 1$

$x^2 - 3x + 2 = 0$

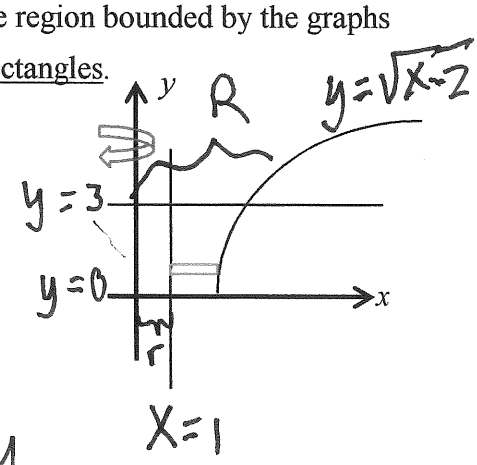
$(x-2)(x-1) = 0$

$x = 2, 1$

$$V = 2\pi \int_1^2 (2-x)\left[(x-1) - (x^2 - 2x + 1)\right] dx$$

SET UP the integral to find the volume of the solid generated by rotating the region bounded by the graphs of $y = \sqrt{x-2}$, $x = 1$, $y = 0$, and $y = 3$ about the y-axis using horizontal rectangles.

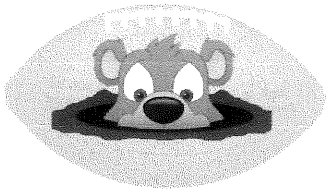
$y^2 + 2 = x$



WASHER

$R(y) = y^2 + 2$

$r(y) = 1$

$$V = \pi \int_0^3 \left[(y^2+2)^2 - (1)^2\right] dy$$

Happy Groundhog's Day!