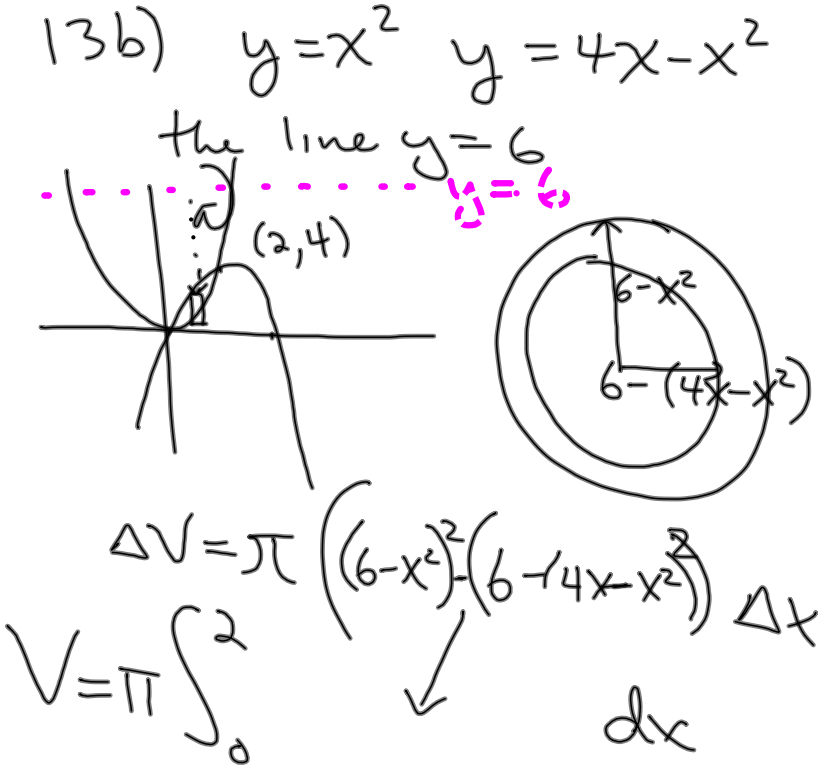
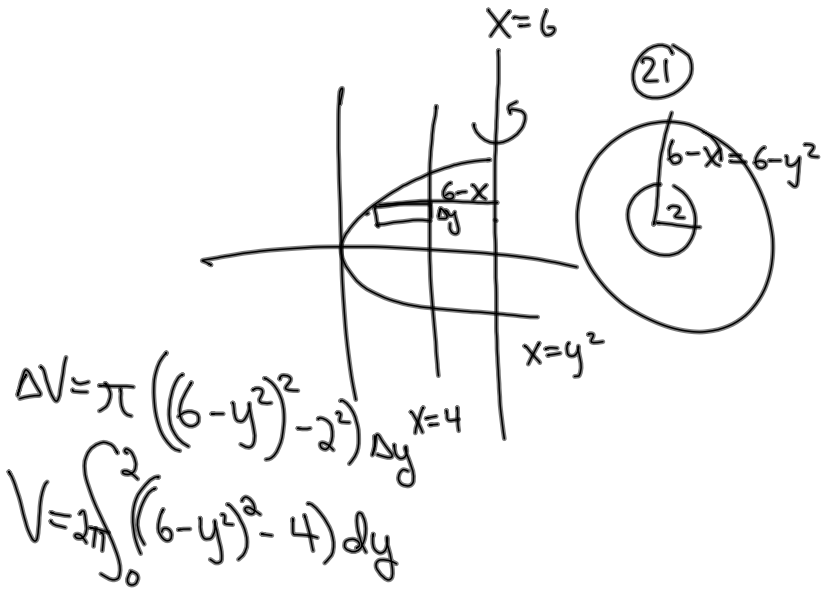
HW: Finish your group's AP Problems on Volume
For Thursday: Finish all AP Problems on Volume

DO NOW:

Check-in on Area and Volume. NO CALCULATOR.

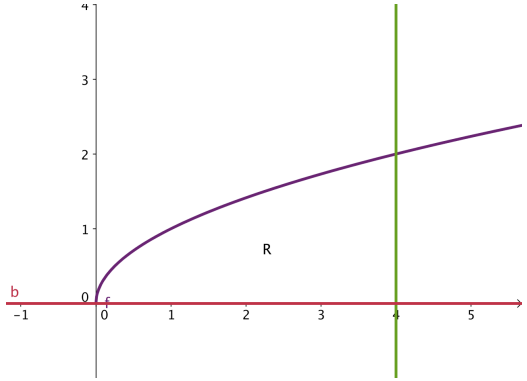
Go over HW with your group.
Write questions from homework on side board.





1998 AB-1

1. Let R be the region bounded by the x–axis, the graph of $y = \sqrt{x}$, and the line $x = 4$.
   (a) Find the area of the region R.
   (b) Find the value of h such that the vertical line $x = h$ divides the region R into two regions of equal area.
   (c) Find the volume of the solid generated when R is revolved about the x–axis.
   (d) The vertical line $x = k$ divides the region R into two regions such that when these two regions are revolved about the x–axis, they generate solids with equal volumes. Find the value of k.



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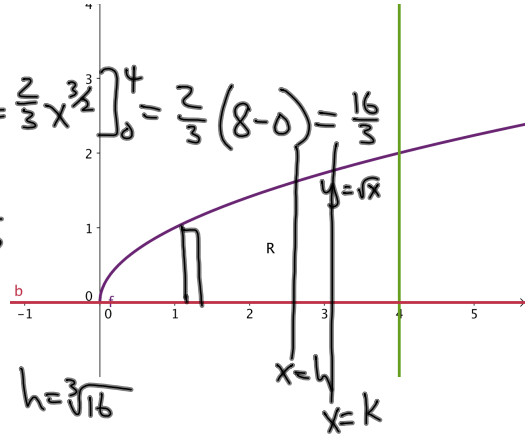


a) $\int_0^4 \sqrt{x}\,dx = \frac{2}{3}x^{3/2}\Big]_0^4 = \frac{2}{3}(8-0) = \frac{16}{3}$

b) $\int_0^h \sqrt{x}\,dx = \frac{8}{3}$

$\frac{2}{3}x^{3/2}\Big]_0^h = \frac{8}{3}$

$\frac{2}{3}h^{3/2} = \frac{8}{3}$ $\quad h = \sqrt[3]{16}$

c) $\Delta V = \pi y^2 \Delta x = \pi x \Delta x$

$V = \pi \int_0^4 x\,dx = 8\pi$

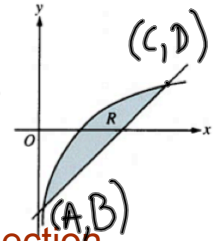
d) $\pi \int_0^k x\,dx = 4\pi$

2006 BC-1

Y_1

Y_2

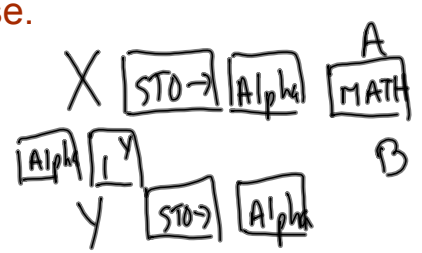
Let R be the shaded region bounded by the graph of $y = \ln x$ and the line $y = x - 2$, as shown above.
(a) Find the area of R.
(b) Find the volume of the solid generated when R is rotated about the horizontal line $y = -3$.
(c) Write, but do not evaluate, an integral expression that can be used to find the volume of the solid generated when R is rotated about the y-axis.



Let's go over how to find the intersection points for the two graphs on the calculator and store them for later use.

$A = X = 0.1586$

$B = Y = -1.8414$



$\int_A^C Y_1 - Y_2\,dx =$