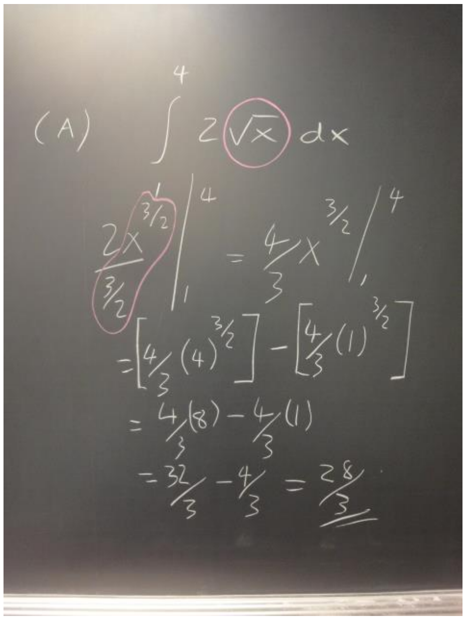
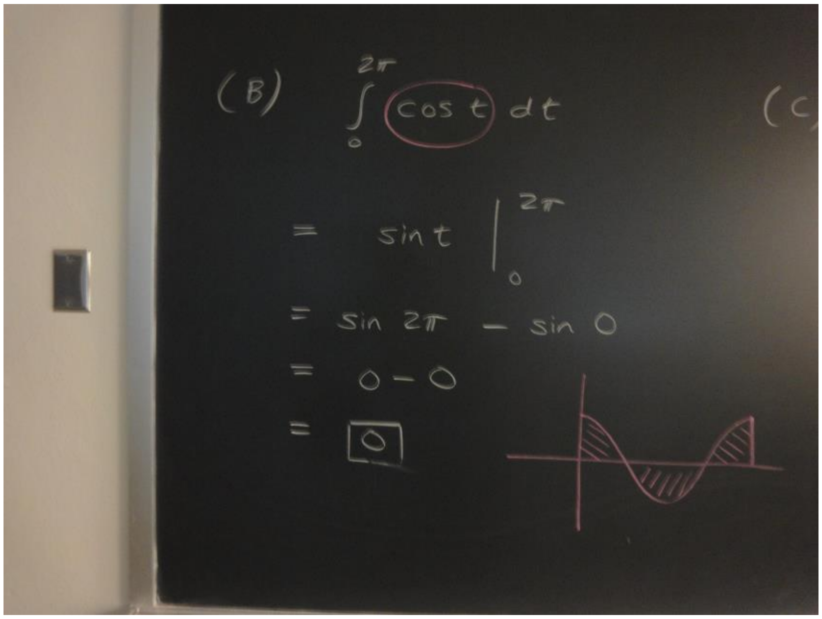
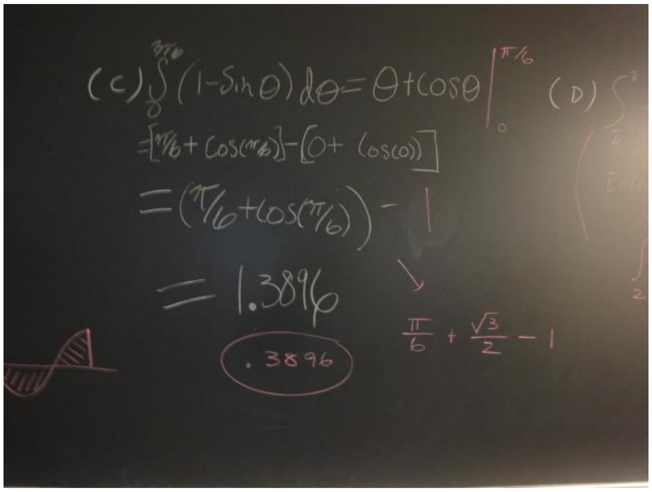
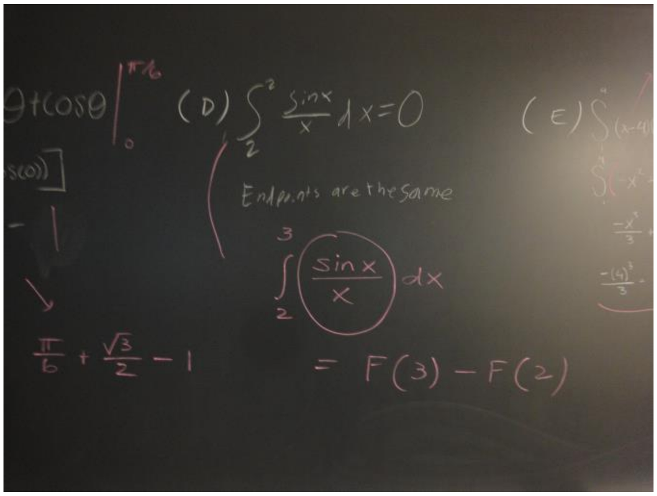
Fundamental Theorem, Part II





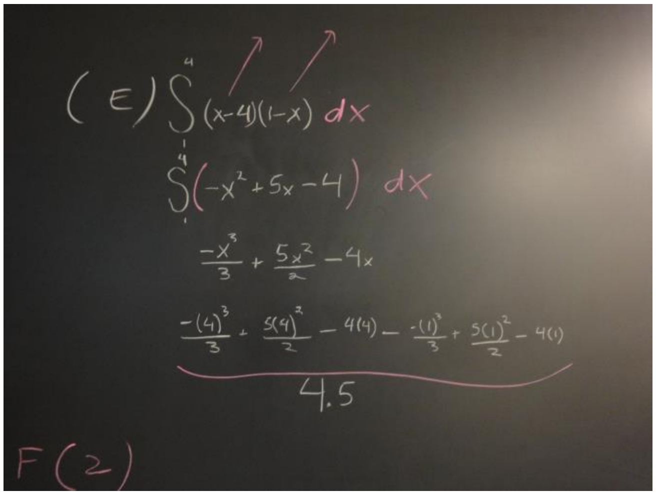
Notice that a picture (using the net area concept) supports why this “area” is zero.

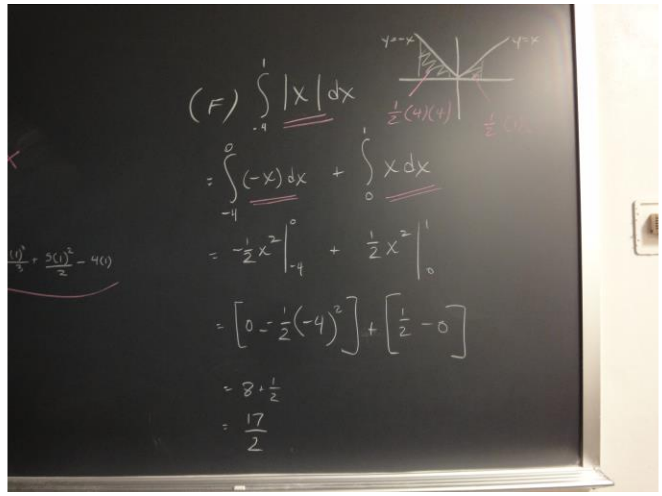




The answer is around 0.3896 (exact answer is also displayed: $\frac{\pi}{6}+\frac{\sqrt{3}}{2}-1$)

Notice: $\frac{\sin x}{x}$ has no obvious antiderivative!





Two ways to attack this one: (1) "Breaking" $|x|$ into its two simple functions $y = x$ and $y = -x$ and then integrating, or (2) drawing a picture and observing that we are finding the areas of rectangles.

<u>When does FTC II fail us???</u>

(1) It is not very helpful if we cannot find an antiderivative. That is, what good is $\int_a^b F'(x)\,dx = F(b) - F(a)$ if you cannot find F ?

(2) Infinite discontinuities are also problematic (see below):