Homework # 1

QSci 292
Winter
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Read:

Neu (3rd ed) sec. 5.8 anti derivatives
Neu (3rd ed) sec. 6.1 & 6.2 definite integral

- This is a creative exercise involving the determination of area. The exact answers are known and are given to you. By the end of the quarter you will be able to obtain these quickly, and hopefully, easily. For now, however, you are asked to estimate the areas by two methods.

- Estimate the area of the region defined by the x-axis (y=0) and the curve y = f(x) which lies between the interval x=a and x=b (see the Fig. 1 below) for the five curves listed below. Use both the method of counting squares and the trapezoid rule. Which method gives the better answer?

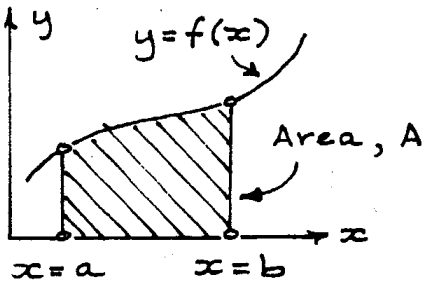
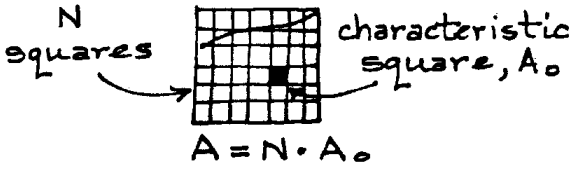


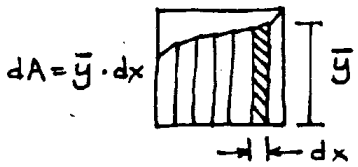
Fig. 1

COUNTING SQUARES



$A = N \cdot A_o$

TRAPEZOID RULE



$A = \sum dA$

Problems

1. $y = 1 + 3x^2$; $a = 0, b = 2$
2. $y = 1/x$; $a = 1, b = 3$
3. $y = e^x$; $a = 0, b = 1$
4. $y = \cos(x)$; $a = 0, b = \frac{\pi}{2}$
5. $y = 1/(1+x^2)$; $a = 0, b = 1$

answers	
1. 10	2. $\ln 3$
3. $e - 1$	4. 1
5. $\pi/4$	