MATH 4A 6

HW #1

5.1

4a. $f(x) = \sin x \quad [0, \frac{\pi}{2}]$ $n=4$

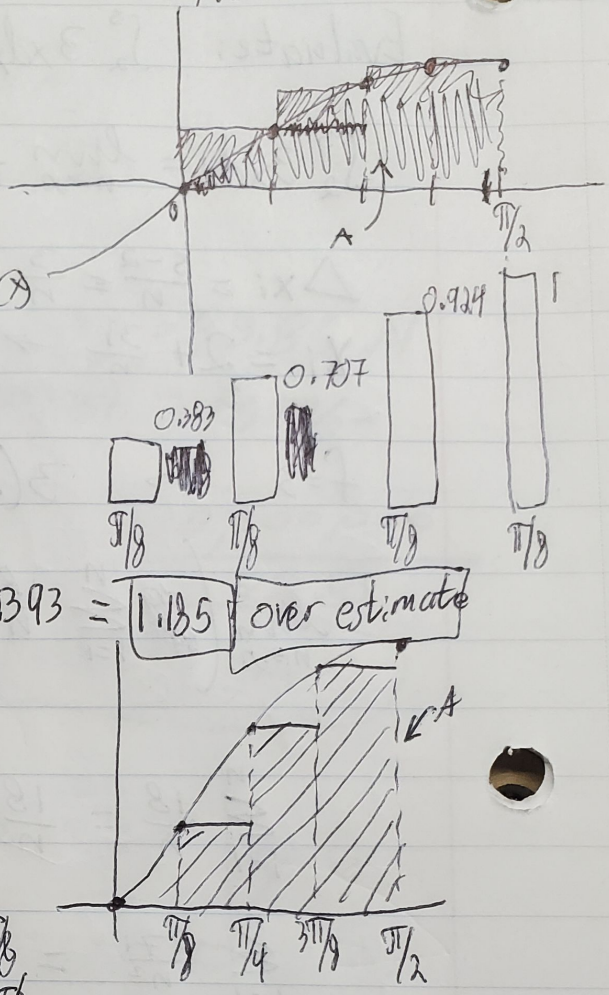
$w = \pi/8$

$[0, \pi/8] \to f(\pi/8) = 0.383$

$[\pi/8, \pi/4] \to f(\pi/4) = 0.707$

$[\pi/4, 3\pi/8] \to f(3\pi/8) = 0.924$

$[3\pi/8, \pi/2] \to f(\pi/2) = 1$



$0.151 + 0.278 + 0.363 + 0.393 = 1.185$ over estimate

4b. $f(x) = \sin x \quad [0, \frac{\pi}{2}]$ $n=4$

$w = \pi/8$

$[0, \pi/8] \to f(0) \to 0 \cdot \pi/8$

$[\pi/8, \pi/4] \to f(\pi/8) \to 0.383 \cdot \pi/8$

$[\pi/4, 3\pi/8] \to f(\pi/4) \to 0.707 \cdot \pi/8$

$[3\pi/8, \pi/2] \to f(3\pi/8) \to 0.924 \cdot \pi/8$

$0 + 0.151 + 0.278 + 0.363\pi$

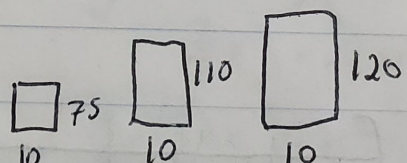
$= 0.792$ underestimate

18. $f(x) = ?$ $[0, 30]$ $n=3$ $w=10$

$[0, 10] \quad f(10) \simeq 75$

$[10, 20] \quad f(20) \simeq 110$

$[20, 30] \quad f(30) \simeq 120$



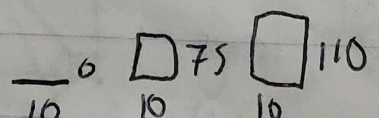
$750 + 1100 + 1200 = 3050$

$(3050 + 1850)/2 = 2450$ ft²

$[0, 10] \quad f(0) \simeq 0$

$[10, 20] \quad f(10) \simeq 75$

$[20, 30] \quad f(20) \simeq 110$



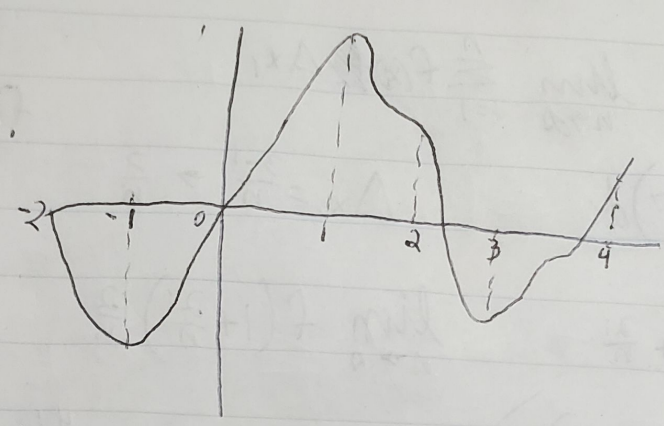
$0 + 750 + 1100 = 1850$

21. $\int_1^3 \frac{2x}{x^2+1}$

$$\lim_{n \to 3} \sum_{i=1}^{n} \frac{2n}{n^2+1}$$

5.2

6.



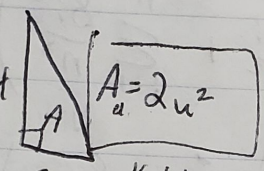
[-2, -1]
[-1, 0]
[0, 1]
[1, 2]
[2, 3]
[3, 4]

width = 1

a) right: +1.5, 0, 1.5, 0.5, +1, 0.5 = 5 u^2

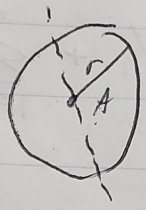
b) left: 0, +1.5, 0, 1.5, 0.5, +1 = 4.5 u^2

34.

a. 

$A_a = 2\ u^2$

½bh

b. 

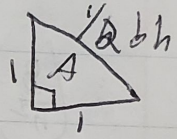
½ πr^2

$A_b = 6.283\ u^2$

c. $A = A_a + A_b + A_c$

$= 8.783\ u^2$

$A_c = 0.5$



½bh

51.

E ≈ 1

B ≈ 3

D ≈ 13

C ≈ 14

A ≈ 17

5.3

2.

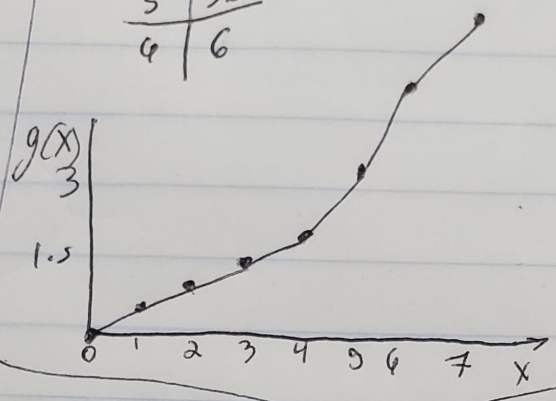
a)

x	g(x)
0	0
1	1/2
2	1
3	1 1/2
4	2
5	3.5
6	6

b) (7, ~~-8~~)

c) max: ~~-8~~ 8
min: 0

d)



8. ~~$g(x) = G'(x)$~~ $g(x) = G'(x)$ $\ln(x^2+1)$

$$\frac{2x}{x^2+1}$$

14. $\frac{z^2}{z^4+1}$

$$\frac{(z^4+1)(2z) - (z^2)(4z^3)}{(z^4+1)^2}$$

$$\frac{2z^5+2z-4z^5}{z^8+2z^4+1}$$

$$\frac{2z-2z^5}{z^8+2z^4+1}$$

26. ~~$\int e^x$~~ $e\int_1$

34. $2\int \sin x - \int e^x$

$-\cos x \quad e^x$

$-2\cos x - e^x + C$

$ex+C \quad x=10$

$=27.18$

$-2\cos 3 - e^3 = -15.11$