Mr. Konichek
hmwk 6.3

6.3 Pg 442 (1, 7, 8, 9)

1. Riemann sum

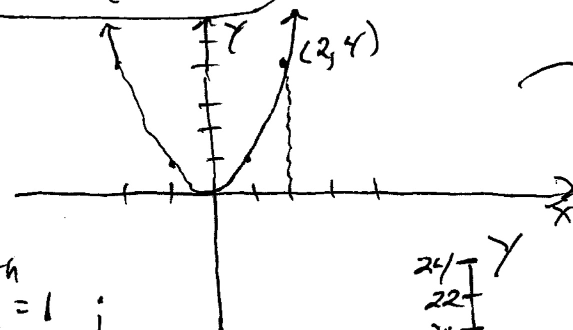
note: all $\frac{1}{3}$ wide with given lengths (heights) $A = lw$

$A_{whole} = wl_1 + wl_2 + wl_3 \ldots$
$= w(l_1 + l_2 + l_3 \ldots)$

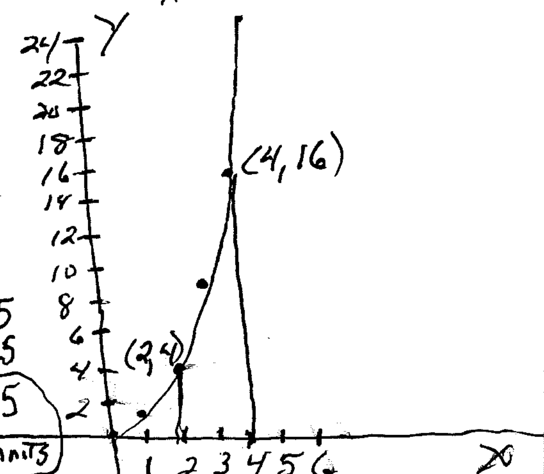
$\frac{1}{3}(1.9 + 1.5 + 1.8 + 2.4 + 2.7 + 2.5)$

$\frac{1}{3}(12.8) = 4.2\bar{6}$ sq. units

7. $f(x) = x^2$



better graph



a. for $n = 2$; $\Delta x = 1$; (width)

$\Delta x = \frac{b-a}{n} = \frac{4-2}{2} = 1$

midpts between 2 & 3; 3 & 4
are 2.5 (x_1), 3.5 (x_2)

The Riemann Sum is $1(2.5^2 + 3.5^2) = 6.25 + 12.25$

$f(x_1) = x_1^2$
$f(x_2) = x_2^2$

18.5 sq. units

b. $n = 5$ so $\Delta x = \frac{b-a}{n} = \frac{4-2}{5} = \frac{2}{5} = .4$ interval $[2, 4]$ (a, b)

midpoint of each subinterval between 2 & 2.4, 2.4 & 2.8, 2.8 & 3.2, etc

$x_1 = 2.2$ $x_2 = 2.6$ $x_3 = 3.0$ $x_4 = 3.4$ $x_5 = 3.8$

$A_{n=5} = .4(2.2^2 + 2.6^2 + 3^2 + 3.4^2 + 3.8^2)$ pattern
$= .4(4.84 + 6.76 + 9 + 11.56 + 14.46) = .4(46.62) = 18.648$ sq. units

c. $n = 10$ so $\Delta x = \frac{b-a}{n} = \frac{4-2}{10} = .2$ 2 & 2.2; 2.2 & 2.4, 2.4 & 2.6
2.1 (x_1); 2.3 (x_2); 2.5 (x_3), etc

$A_{n=10} = .2(2.1^2 + 2.3^2 + 2.5^2 + 2.7^2 + 2.9^2 + 3.1^2 + 3.3^2 + 3.5^2 + 3.7^2 + 3.9^2)$
$= .2(93.3) = 18.66$

d. $\int_a^b x^2 dx = \frac{1}{3}x^3 \Big|_2^4 = \frac{64}{3} - \frac{8}{3} = \frac{56}{3} = 18\frac{2}{3}$ I know the next section.

8. same as #7 only left endpts of the subintervals

interval $[2,4]$

$f(x)=x^2$

from #7 widths same

a. $n=2$ $\Delta x=1$ $x_1=2$; $x_2=3$

$A_{n=2}=1(2^2+3^2)=4+9=13$

$n=5$ b. $\Delta x=\frac{2}{5}=.4$ $x_1=2$; $x_2=2.4$; $x_3=2.8$; $x_4=3.2$; $x_5=3.6$

$A_{n=5}=.4(2^2+2.4^2+2.8^2+3.2^2+3.6^2)=16.32$

$n=10$ c. $\Delta x=\frac{2}{10}=.2$ $x_1=2$; $x_2=2.2$; etc $x_{10}=3.8$

$A_{n=10}=.2(2^2+2.2^2+2.4^2+2.6^2+2.8^2+3^2+3.2^2+3.4^2+3.6^2+3.8^2)=17.48$

d. seems to be approaching 17.5

9. same as #7 & #8 only right endpts of the subintervals

interval $[2,4]$

$f(x)=x^2$

a. $n=2$ $\Delta x=\frac{b-a}{n}=\frac{4-2}{2}=\frac{2}{2}=1$

$x_1=3$; $x_2=4$

$A_{n=2}=1(3^2+4^2)=9+16=25$ sq. units

b. $n=5$ $\Delta x=\frac{2}{5}=.4$ so $x_1=2.4$; $x_2=2.8$; $x_3=3.2$; $x_4=3.6$; $x_5=4$

$A_{n=5}=.4(2.4^2+2.8^2+3.2^2+3.6^2+4^2)=21.12$ sq. units

c. $n=10$ $\Delta x=\frac{2}{10}=.2$; $x_1=2.2$; $x_2=2.4$; etc $x_{10}=4$

$A_{n=10}=.2(2.2^2+2.4^2+2.6^2+2.8^2+3^2+3.2^2+3.4^2+3.6^2+3.8^2+4^2)=19.88$ sq. units

d. the area appears to be around 19.8 sq. units

My curiosity says to average #8 & #9

$$\begin{array}{r} 17.5 \\ +\,19.8 \\ \hline 37.3 \end{array}$$

$\frac{37.3}{2}=18.65$ Note close

Correct answer 18.66