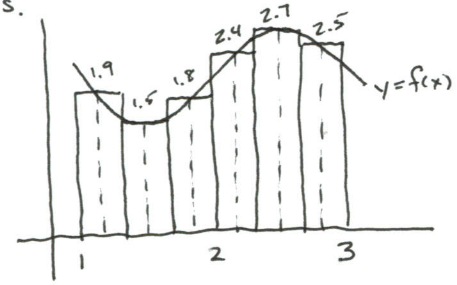
hw solutions
section 6.3

1. find an approx. of the area under the curve using Riemann sums.



$\Delta x = \frac{3-1}{6} = 1/3$

$R = \frac{1}{3}\cdot 1.9 + \frac{1}{3}\cdot 1.5 + \frac{1}{3}\cdot 1.8 + \frac{1}{3}\cdot 2.4 + \frac{1}{3}\cdot 2.7 + \frac{1}{3}\cdot 2.5$

$= 4.2\overline{6}$

15. $f(x) = \frac{1}{x}$, $[1,3]$, find R_4

$\Delta x = \frac{3-1}{4} = \frac{1}{2}$

right endpts:

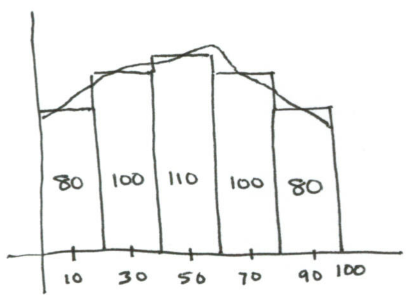
$R_4 = \Delta x\left[f(3/2) + f(2) + f(5/2) + f(3)\right]$

$= \frac{1}{2}\left[\frac{2}{3} + \frac{1}{2} + \frac{2}{5} + \frac{1}{3}\right]$

$= \frac{1}{2}\left[1 + \frac{5}{10} + \frac{4}{10}\right]$

$= \frac{1}{2}\cdot\frac{19}{10} = \frac{19}{20} = .95$

17.



what is the approx area of the lot?

$20\cdot 80 + 20\cdot 100 + 20\cdot 110 + 20\cdot 100 + 20\cdot 80$

$= 1600 + 2000 + 2200 + 2000 + 1600$

$= 3200 + 4000 + 2200$

$= 9400 \text{ ft}^2$

5. $f(x) = 4 - 2x$

(a) Sketch R on $[0,2]$ & find its value

$\text{area} = \frac{1}{2}\cdot 2\cdot 4 = 4$

(b) find L_5

$n=5$, $\Delta x = \frac{2-0}{5} = 2/5$

left endpts:

$L_5 = \Delta x\left[f(0) + f(2/5) + f(4/5) + f(6/5) + f(8/5)\right]$

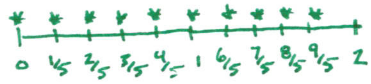
$= 2/5\left[4 + 3.2 + 2.4 + 1.6 + .8\right]$

$= 4.8$

(c) find L_{10}

$n=10$, $\Delta x = \frac{2-0}{10} = 1/5$

left endpts:



$L_{10} = \Delta x\left[f(0) + f(1/5) + \dots + f(9/5)\right]$

$= \frac{1}{5}\left[4 + 3.6 + 3.2 + 2.8 + 2.4 + 2 + 1.6 + 1.2 + .8 + .4\right] = (22)(\frac{1}{5}) = 4.4$

(d) compare L_5, L_{10} & the exact area

$L_5 > L_{10} >$ exact area
(4.8) (4.4) (4)

as n increases, the approximations get closer to the exact value