HW (4.2) p.260-261 #1-9:odd; #23,25,27

Marshall Math – HW Solutions Course Calculus

#1

$$\sum_{i=1}^{5}(2i+1) = 2\sum_{i=1}^{5} i + \sum_{i=1}^{5} 1$$

$$= 2(1+2+3+4+5)+5$$

$$= 35$$

#3

$$\sum_{k=0}^{4}\frac{1}{k^2+1} = 1+\frac{1}{2}+\frac{1}{5}+\frac{1}{10}+\frac{1}{17}$$

$$= \frac{158}{85}$$

#5

$$\sum_{k=1}^{4} c = c+c+c+c = 4c$$

#7

$$\sum_{i=1}^{9}\frac{1}{3i}$$

#9

$$\sum_{j=1}^{8}\left[2\left(\frac{j}{8}\right)+3\right]$$

#23

$$\lim_{n\to\infty}\left[\left(\frac{4}{3n^3}\right)(2n^3+3n^2+n)\right]$$

$$= \lim_{n\to\infty}\left[\frac{8}{3}+\frac{4}{n}+\frac{4}{3n^2}\right] = \frac{8}{3}$$

#25

$$\lim_{n\to\infty}\left[\left(\frac{81}{n^4}\right)\frac{n^2(n+1)^2}{4}\right]$$

$$\cancel{= \lim_{n\to\infty}} = \frac{81}{4}\lim_{n\to\infty}\left[\frac{n^4+2n^3+n^2}{n^4}\right]$$

$$= \frac{81}{4}(1) = \frac{81}{4}$$

#27

$$\lim_{n\to\infty}\left[\left(\frac{64}{n^3}\right)\frac{n(n+1)(2n+1)}{6}\right]$$

$$= \frac{64}{6}\lim_{n\to\infty}\left[\frac{2n^3+3n^2+n}{n^3}\right]$$

$$= \frac{64}{6}(2) = \frac{64}{3}$$

#41 $y = -2x+3$ on $[0,1]$

$\Delta x = \frac{1-0}{n} = \frac{1}{n}$

$c_i = 0+\frac{i}{n}$

$$s(n) = \sum_{i=1}^{n} f\left(\frac{i}{n}\right)\left(\frac{1}{n}\right)$$

$$= \sum_{i=1}^{n}\left[-2\left(\frac{i}{n}\right)+3\right]\left(\frac{1}{n}\right)$$

$$= 3 - \frac{2}{n^2}\sum_{i=1}^{n} i = 3 - \frac{2(n+1)n}{2n^2}$$

$$= 2-\frac{1}{n}$$

$$\text{Area} = \lim_{n\to\infty} s(n)$$

$$= 2$$