6.2 HW p. 408-412 #~~33-38 all~~, 51, 53

51) $\int_0^1 x-4\,dx$ $\quad w=\frac{b-a}{n} \to \frac{1-0}{n}=\frac{1}{n}$

$\lim_{n\to\infty} \sum_{i=1}^{n} \frac{1}{n}\cdot f(a+\frac{1}{n}i) \to \frac{1}{n} f(\frac{1}{n}i) \to \frac{1}{n}\left[(\frac{i}{n})-4\right]$

$\sum \frac{i}{n^2}-\frac{4}{n} \to \frac{1}{n^2}\sum_{i=1}^{n} i - \frac{4}{n}\sum_{i=1}^{n} 1 \to \frac{1}{n^2}\left(\frac{n(n+1)}{2}\right)-\frac{4}{n}(n)$

$\lim_{n\to\infty} \frac{n^2+n}{2n^2}-\frac{4n}{n} \to \frac{1}{2}-4=\boxed{\frac{-7}{2}}$

53) $\int_0^2 (2x+1)\,dx$ $\quad w=\frac{2-0}{n}\to\frac{2}{n}$ $\quad f(\,)=2(\,)+1$

$f(\frac{2}{n}i)=2(\frac{2}{n}i)+1$

$\sum_{i=1}^{n} \frac{2}{n}\cdot\left[f(0+\frac{2}{n}i)\right]$

$\sum_{i=1}^{n} \frac{2}{n}\left[\frac{4}{n}i+1\right] \to \sum_{i=1}^{n} \frac{8}{n^2}i+\frac{2}{n}$

$\frac{8}{n^2}\sum_{i=1}^{n} i + \frac{2}{n}\sum_{i=1}^{n} 1 \to \frac{8}{n^2}\cdot\frac{n(n+1)}{2}+\frac{2}{n}(n)$

$\lim_{n\to\infty} \frac{8n^2+8n}{2n^2}+\frac{2n}{n} \to 4+2=\boxed{6}$