Additional Questions for Homework on Section 8.6

A. Approximate the following integrals using (i) the Midpoint Rule with $n = 4$, (ii) the Trapezoid Rule with $n = 4$ and (iii) using Simpson Rule with $n = 4$.

(a) $\int_1^3 x^3 \, dx$

(b) $\int_0^\pi \sin x \, dx$

(c) $\int_0^8 \frac{1}{1+x^3} \, dx$

B. Approximate the following integral using (i) the Midpoint Rule with $n = 6$, (ii) the Trapezoid Rule with $n = 6$ and (iii) using Simpson Rule with $n = 6$.

(a) $\int_1^{10} x^2 \, dx$

(b) $\int_0^4 e^x \, dx$

(c) $\int_{-1}^2 \frac{1}{1+x^2} \, dx$

C. Recall the integral construction of the natural logarithm (i.e. $\ln x = \int_1^x \frac{1}{t} \, dt$).

(a) Using the Trapezoid Rule with $n = 10$ estimate $\ln 2$.

(b) Using Simpson's Rule with $n = 10$, estimate $\ln 2$.