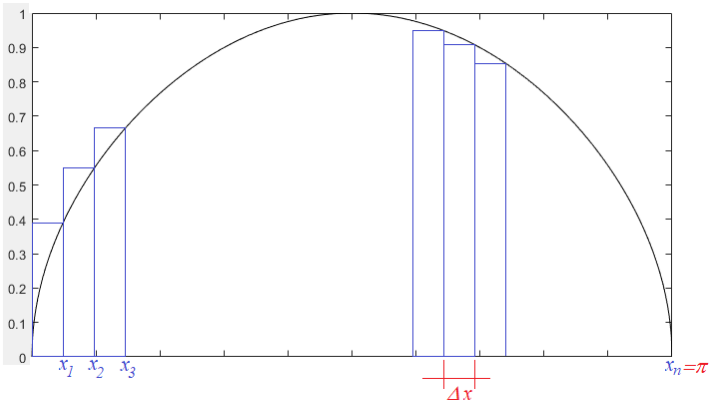
Calculus

Definite Integrals

Problem 1.- Write an expression for the area under the graph of f as a limit

$$f(x)=\sqrt{\sin x} \qquad 0\le x\le \pi$$

Solution: We can divide the interval in *n* segments and calculate the area under the graph as a limit of the sum of the rectangles when *n* goes to infinity.



$$Area=\lim_{n\to\infty}\sum_{i=1}^{n} f(x_i)\Delta x$$

The length of each segment is $\Delta x=\dfrac{\pi}{n}$

If we use the right side of each rectangle $x_i=i\dfrac{\pi}{n}$

$$Area=\lim_{n\to\infty}\sum_{i=1}^{n}\sqrt{\sin\left(i\frac{\pi}{n}\right)}\frac{\pi}{n}$$