2.

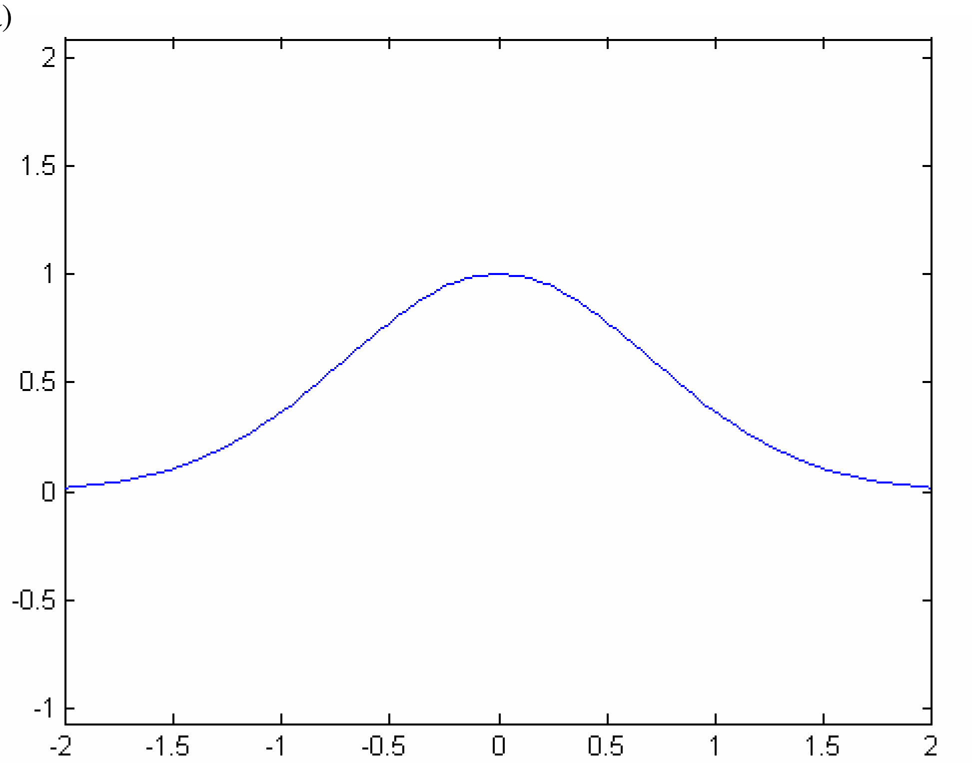
(a)(1) $L_6 = 84$ (2) $R_6 = 68$ (3) $M_6 = 72$

(b)overestimate

(c)underestimate

(d) M_6 since L_6 is overestimate and R_6 is underestimate

6.(a)

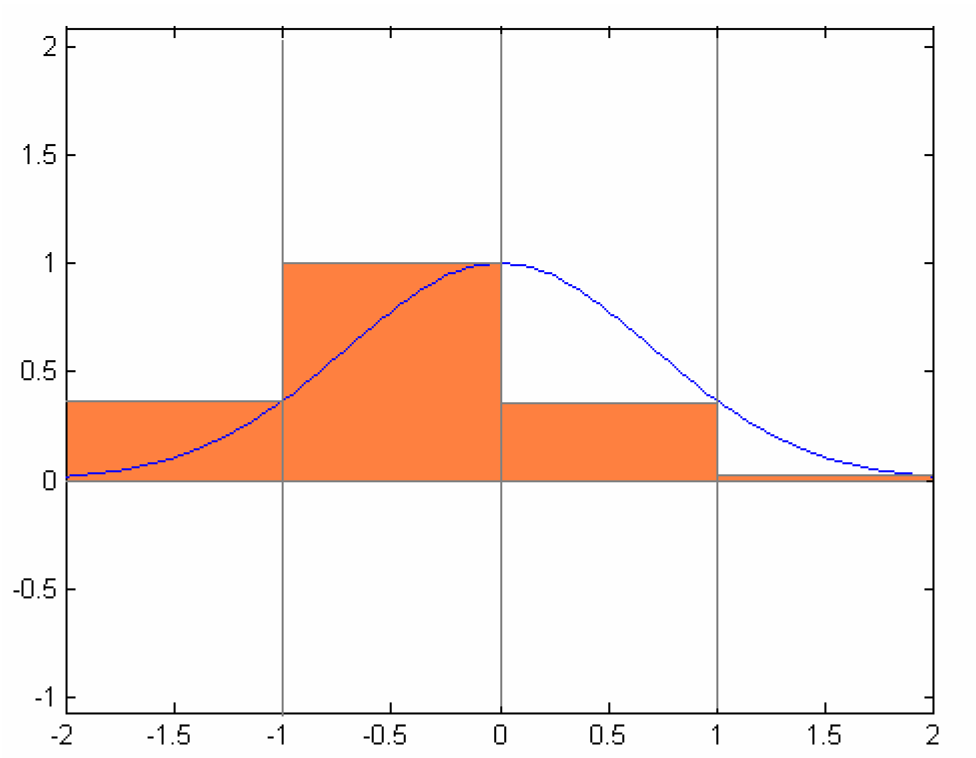


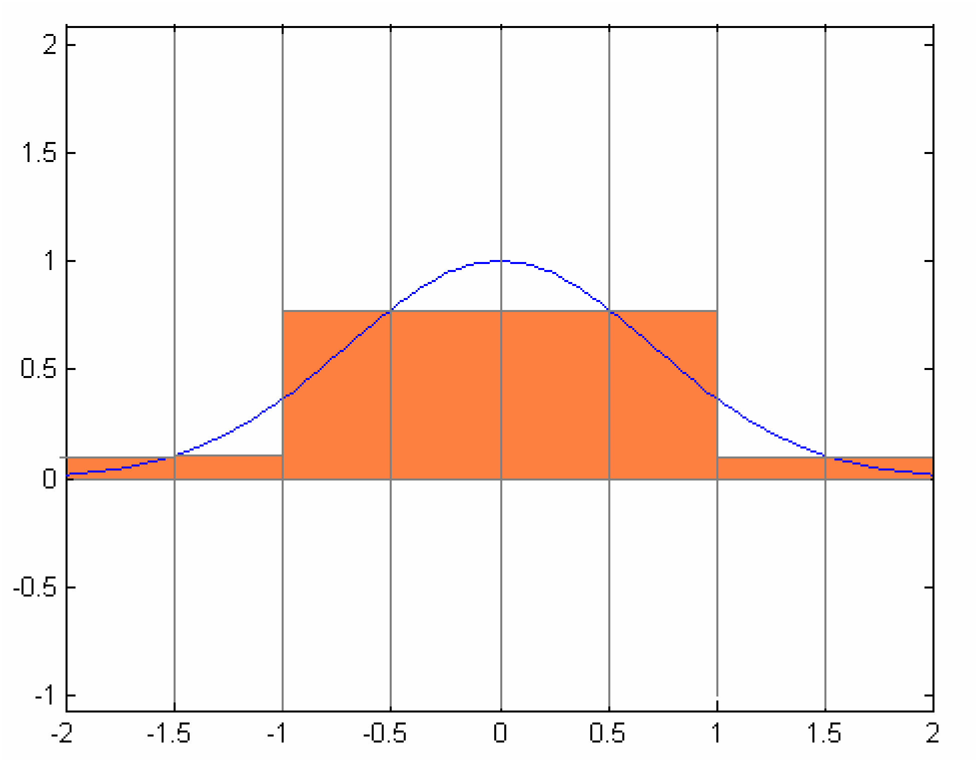
(b) f(-1)=0.3679 f(0)=1 f(1)=0.3679 f(2)=0.0183

$f(-1.5) = f(1.5) = 0.1054$ $f(-0.5) = f(0.5) = 0.7788$

Using right end points:1.7541

Using midpoints:1.7684





(c) Using right end points with 8 rectangles:1.7612

21.

$$\lim_{n\to\infty}\sum_{i=1}^{n}\frac{\pi}{4n}\tan\frac{i\pi}{4n}=\int_0^{\frac{\pi}{4}}\tan x dx$$ area:from 0 to π /4 under tangent function

22.

(a). $\int_0^1 x^3 dx = \lim_{n\to\infty} \frac{1}{n} \sum_{i=1}^{n} (\frac{i}{n})^3$

(b) $\int_0^1 x^3 dx = \lim_{n\to\infty} \frac{1}{n} \sum_{i=1}^{n} (\frac{i}{n})^3 = \lim_{n\to\infty} \frac{1}{n^4} \sum_{i=1}^{n} i^3 = \lim_{n\to\infty} \frac{1}{n^4} \left[\frac{n(n+1)}{2} \right]^2 = \lim_{n\to\infty} \left[\frac{1(1+\frac{1}{n})}{2} \right]^2 = \frac{1}{4}$

23.

(a) $\int_0^2 x^5 dx = \lim_{n\to\infty} \frac{2}{n} \sum_{i=1}^{n} \left(\frac{2i}{n} \right)^5$

(b) $\sum_{k=1}^{n} k^5 = \frac{1}{6} n^6 + \frac{1}{2} n^5 + \frac{5}{12} n^4 - \frac{1}{12} n^2$

(c)

$$\int_0^2 x^5 dx = \lim_{n\to\infty} \frac{2}{n} \sum_{i=1}^{n} \left(\frac{2i}{n} \right)^5 = \lim_{n\to\infty} \frac{2^6}{n^6} \sum_{i=1}^{n} i^5 = \lim_{n\to\infty} \frac{2^6}{n^6} \sum_{i=1}^{n} i^5 = \lim_{n\to\infty} \frac{2^6}{n^6} (\frac{1}{6} n^6 + \frac{1}{2} n^5 + \frac{5}{12} n^4 - \frac{1}{12} n^2) = \frac{2^6}{6} = \frac{32}{3}$$

26.

(a) $P_n = \frac{1}{2} r^2 \sin\theta$ ， $\theta = \frac{2\pi}{n}$ ， $A_n = nP_n = \frac{1}{2} nr^2 \sin(\frac{2\pi}{n})$

(b) $\lim_{n\to\infty} A_n = \lim_{n\to\infty} \frac{1}{2} nr^2 \sin(\frac{2\pi}{n}) = \lim_{n\to\infty} r^2 \frac{\sin(\frac{2\pi}{n})}{\frac{2\pi}{n}} \pi = r^2 \pi$