

$$\begin{cases} 3 & x < \frac{1}{2} \\ 0 & \frac{1}{2} \leq x \end{cases} \quad (3)$$

> # Truncated sine series S(x,n)

> B:=n->eval((2/L)\*int(f(x)\*sin(n\*Pi\*x/L),x=0..L));

$$B := n \rightarrow \text{eval} \left( \frac{2 \left( \int_0^L f(x) \sin\left(\frac{n\pi x}{L}\right) dx \right)}{L} \right) \quad (4)$$

> B(1);

$$-\frac{-2 + \sqrt{3}}{\pi} + \frac{3\sqrt{3}}{\pi} \quad (5)$$

> B(n) assuming n > 0;

$$-\frac{2 \left( -1 + \cos\left(\frac{1}{6} n\pi\right) \right)}{n\pi} + \frac{6 \left( \cos\left(\frac{1}{6} n\pi\right) - \cos\left(\frac{1}{2} n\pi\right) \right)}{n\pi} \quad (6)$$