

```
> 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);B(n) assuming n > 0;
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$$\frac{2}{\pi} \frac{-1 + \cos \left( \frac{1}{2} n\pi \right)}{n\pi} \quad (5)$$

```
> # Truncated sine series S(x,n)
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```
> S:=(x,n)->sum(B(k)*sin(k*Pi*x/L),k=1..n);plot(S(x,50),x=-5*L..5*L);
```

$$S := (x, n) \rightarrow \sum_{k=1}^n B(k) \sin \left( \frac{k\pi x}{L} \right)$$