```
# f(x)=1 on L/2<x<L, f(x)=0 elsewhere
> L:=1;
```

$$L := 1 \tag{1}$$

```
> f:=x->piecewise(x<L/2,0, x<L,1,0);
```

$$f := x \rightarrow piecewise\left(x < \frac{1}{2} L,\ 0,\ x < L,\ 1,\ 0 \right) \tag{2}$$

```
> convert(f(x),piecewise,x);
```

$$
\begin{cases}
0 & x < \dfrac{1}{2} \\[2mm]
1 & x < 1 \\[2mm]
0 & 1 \le x
\end{cases}
\tag{3}
$$

```
> A:=n->(2/L)*int(f(x)*cos(n*Pi*x/L),x=0..L);
```

$$A := n \rightarrow \frac{2\left(\displaystyle\int_0^L f(x) \cos\left(\frac{n\pi x}{L} \right) dx \right)}{L} \tag{4}$$

```
> A0:=(1/L)*int(f(x),x=0..L);
```

$$A0 := \frac{1}{2} \tag{5}$$