Appendix A
Function Definitions

Below are definitions of several functions used throughout the book. They are provided here so that the reader knows what conventions are being used for these functions.

The rectangle function (sometimes called the box function) is defined as

$$\text{rect}\left(\frac{x}{a}\right) = \begin{cases} 1 & x < \frac{a}{2} \\ \frac{1}{2} & x = \frac{a}{2} \\ 0 & x > \frac{a}{2}. \end{cases} \tag{A.1}$$

The triangle function (sometimes called the hat or tent function) is defined as

$$\text{tri}\,(ax) = \begin{cases} 1 - |ax| & |ax| < 1 \\ 0 & \text{otherwise.} \end{cases} \tag{A.2}$$

The sinc function is defined as

$$\text{sinc}\,(ax) = \frac{\sin(a\pi x)}{a\pi x}. \tag{A.3}$$

The comb function (sometimes called the Shah function) is defined as

$$\text{comb}\,(ax) = \sum_{n=-\infty}^{\infty} \delta\,(ax - n), \tag{A.4}$$

where $\delta\,(x)$ is the Dirac delta function.[90]

The circle function (sometimes called the cylinder function) is defined as

$$\text{circ}\left(\frac{\sqrt{x^2 + y^2}}{a}\right) = \begin{cases} 1 & \sqrt{x^2 + y^2} < a \\ \frac{1}{2} & \sqrt{x^2 + y^2} = a \\ 0 & \sqrt{x^2 + y^2} > a. \end{cases} \tag{A.5}$$

The jinc function (sometimes called the besinc or sombrero function) is defined as

$$\text{jinc}\,(ax) = 2\frac{J_1\,(a\pi x)}{a\pi x}, \tag{A.6}$$

where $J_n\,(x)$ is a Bessel function of the first kind of order n.[90]