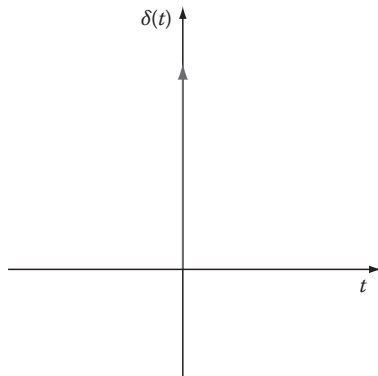
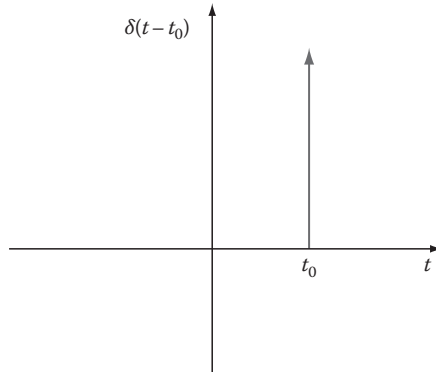


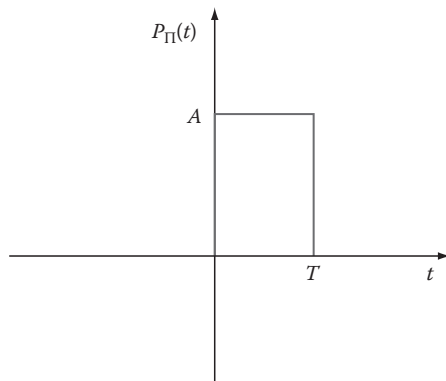
**Figure 2.1**  $\delta_{\Delta}(t)$  function.



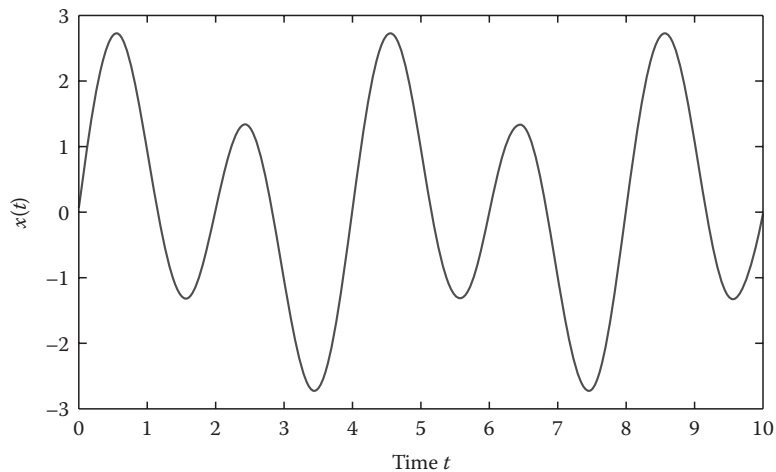
**Figure 2.2** Visual representation of an impulse function.



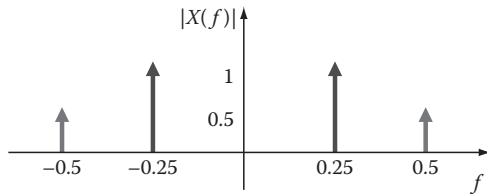
**Figure 2.3** Shifted impulse function.



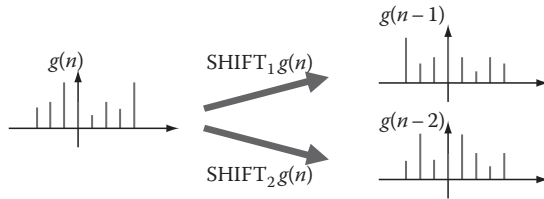
**Figure 2.4** Unit pulse function.



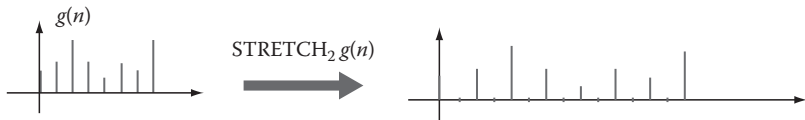
**Figure 2.5** A given time signal.



**Figure 2.6** FT of the time signal in Figure 2.5.

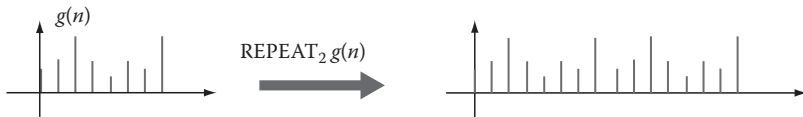


**Figure 2.7** Circular shift of a signal  $g(n)$ .

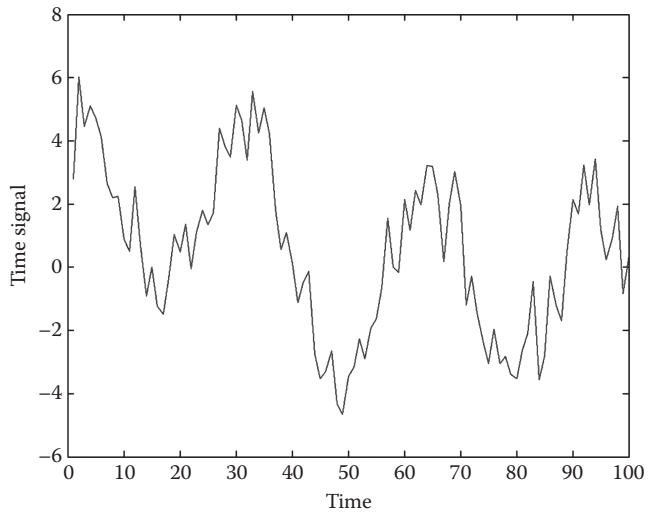


**Figure 2.8** Stretch of a signal.

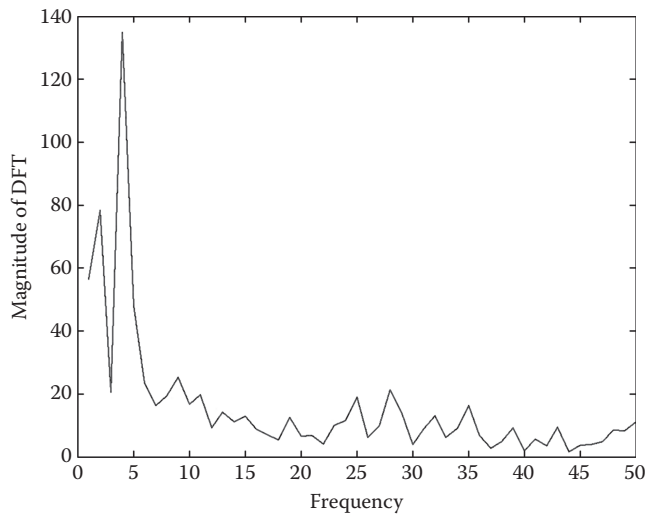




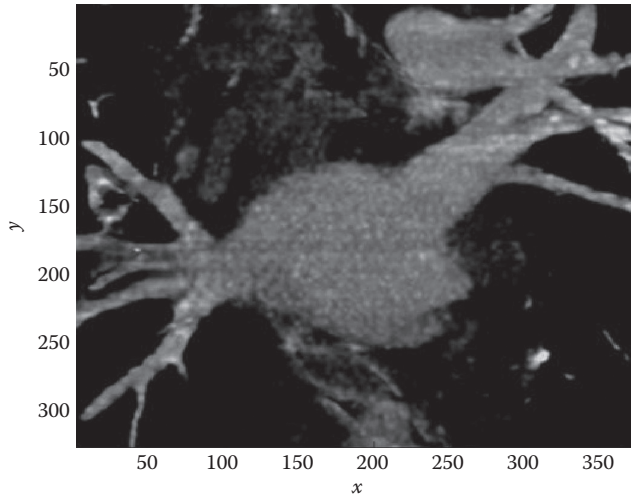
**Figure 2.9** Repeat of a signal.



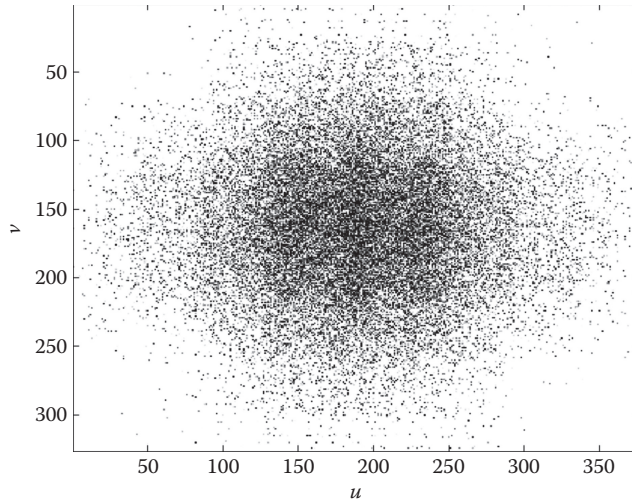
**Figure 2.10** Signal  $x$  defined in the time domain.



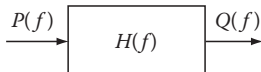
**Figure 2.11** Magnitude of DFT of signal  $x$ .



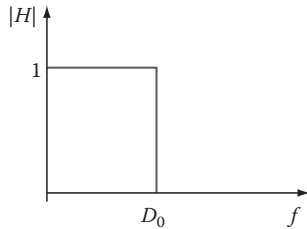
**Figure 2.12** Image  $g(x, y)$ . (Courtesy of Andre D'Avila, MD, Heart Institute (InCor), University of Sao Paulo, Medical School, Sao Paulo, Brazil.)



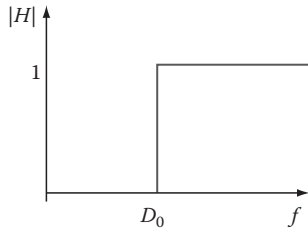
**Figure 2.13** Magnitude of 2-D DFT of image  $g(x, y)$ .



**Figure 2.14** Filtering signals and images using filter  $H(f)$ .

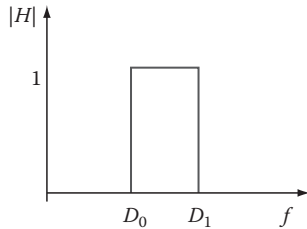


**Figure 2.15** Ideal low-pass filter.

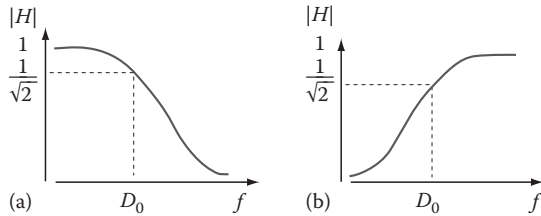


**Figure 2.16** Ideal high-pass filter.

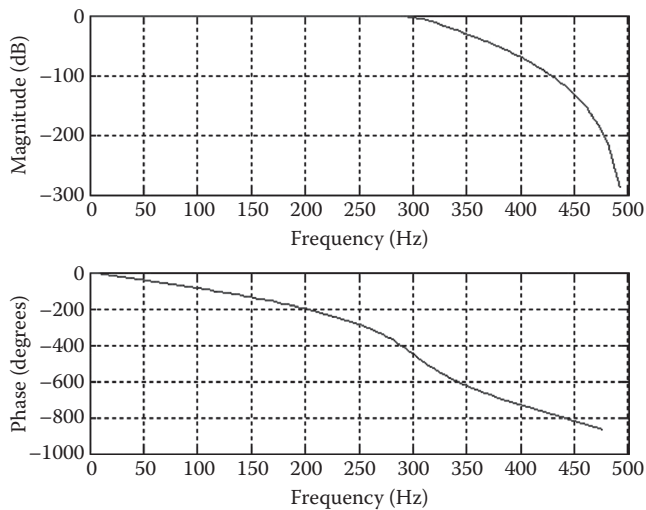




**Figure 2.17** Ideal band-pass filter.



**Figure 2.18** (a) Low-pass Butterworth filter and (b) high-pass Butterworth filter.



**Figure 2.19** Frequency response of Butterworth filter designed in Example 2.3.