

Chapter 2 Figures

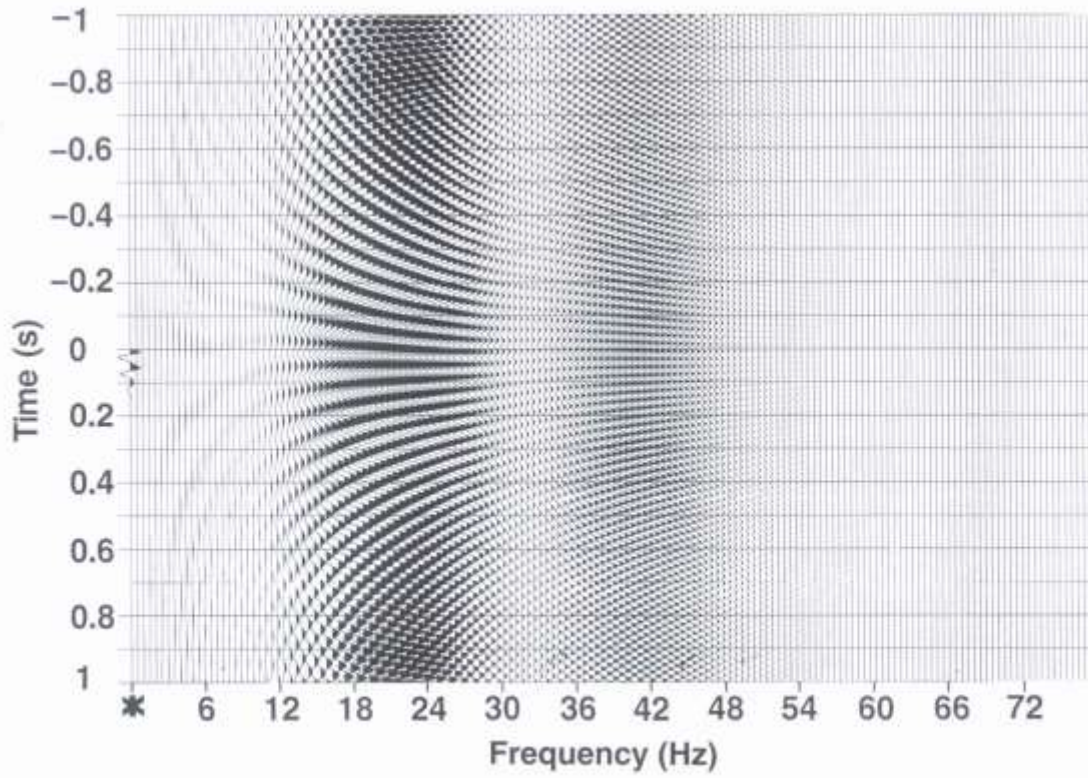


FIG. 1.1-2. An ensemble of sinusoidal motions with different frequency, peak amplitude, and phase-lag can be superimposed to synthesize a time-dependent waveform on the trace as indicated by the asterisk.

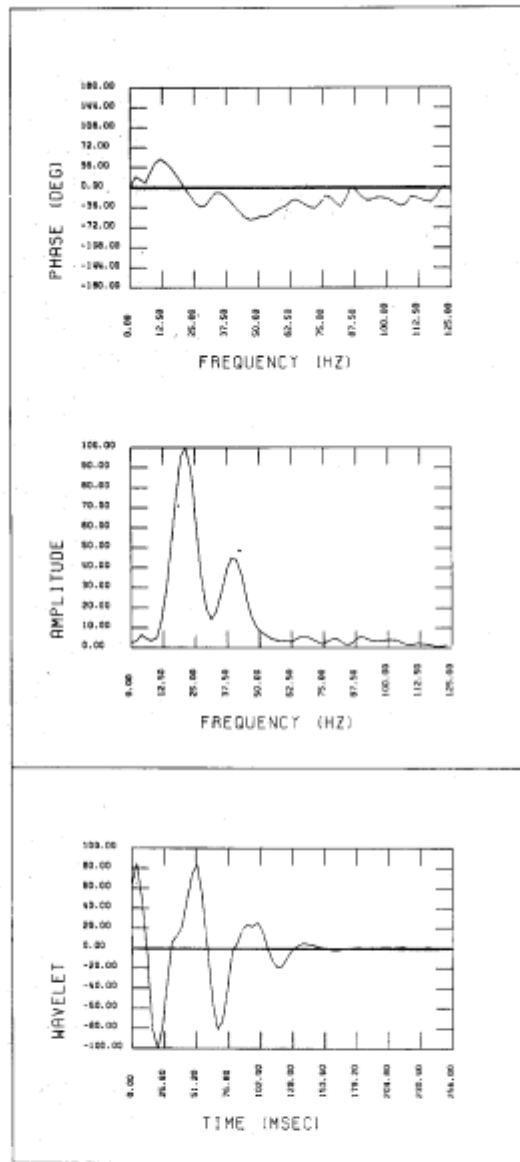
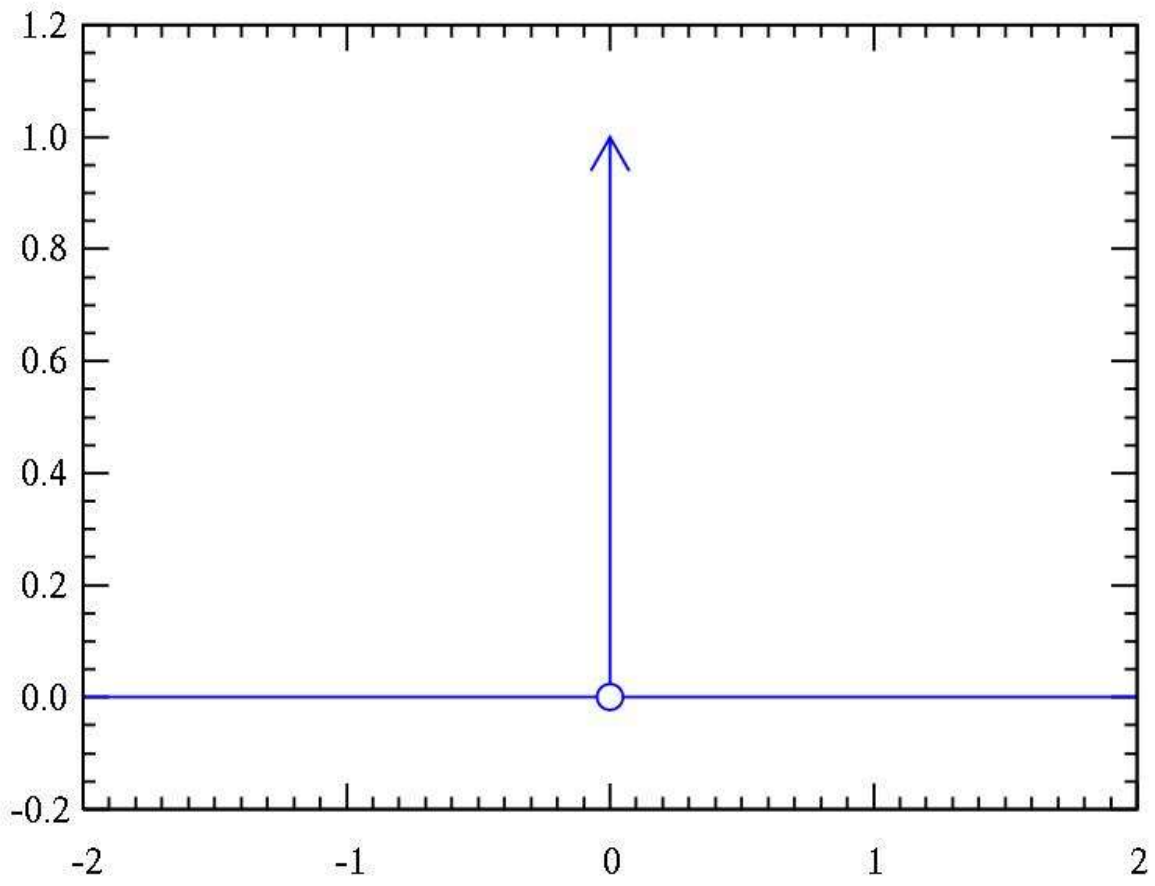
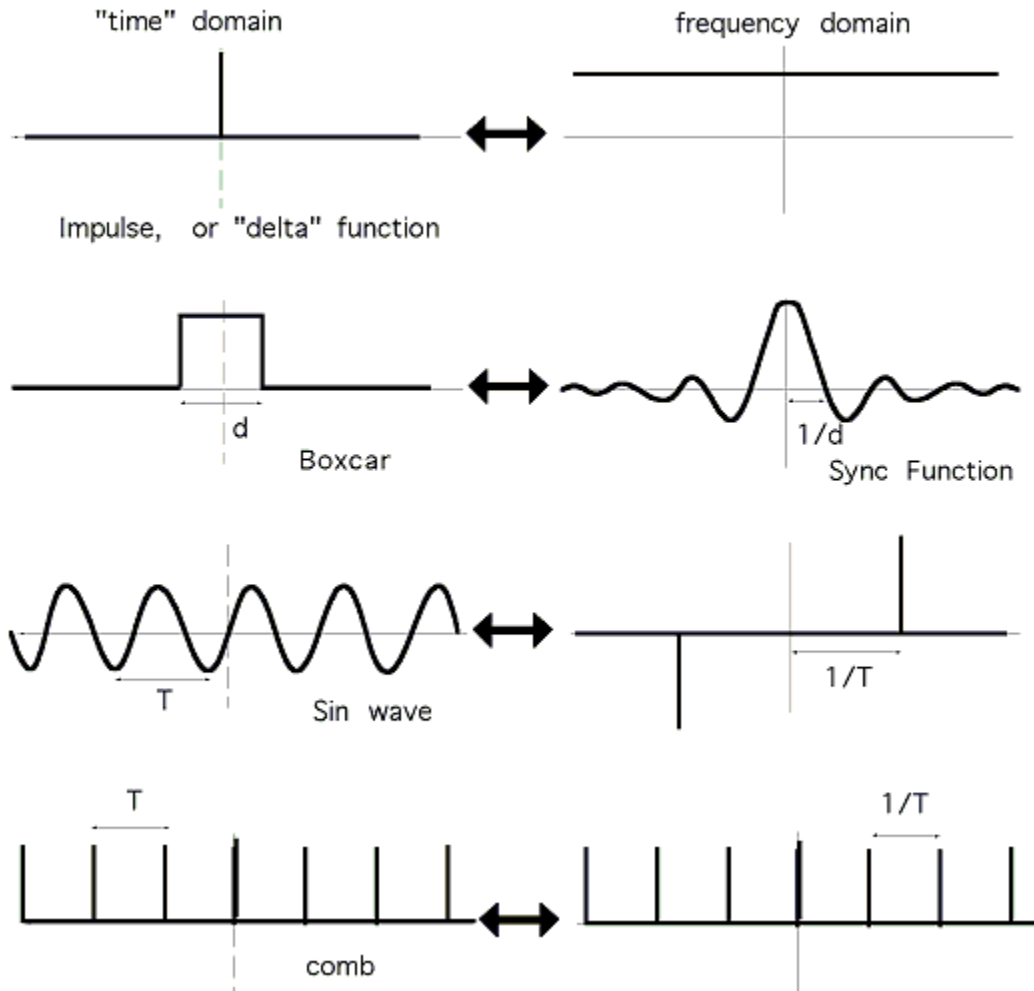
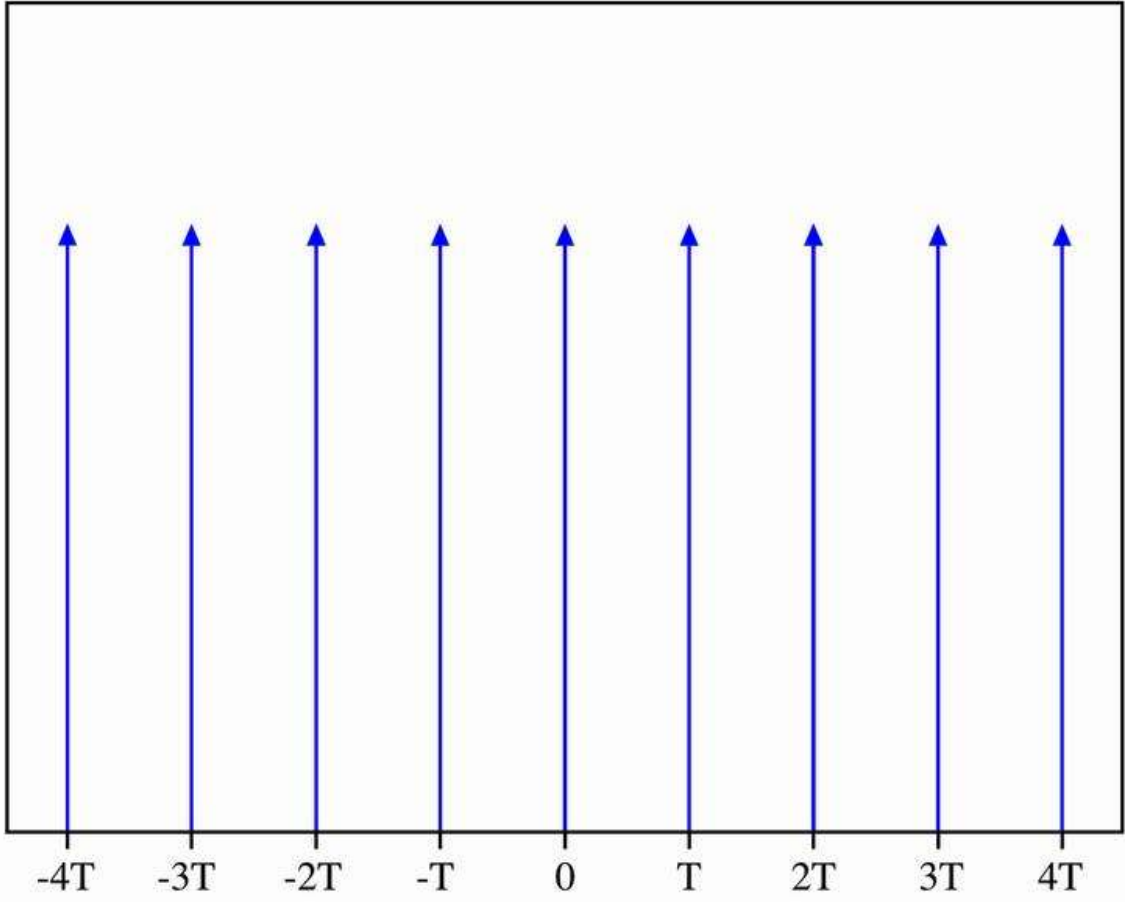
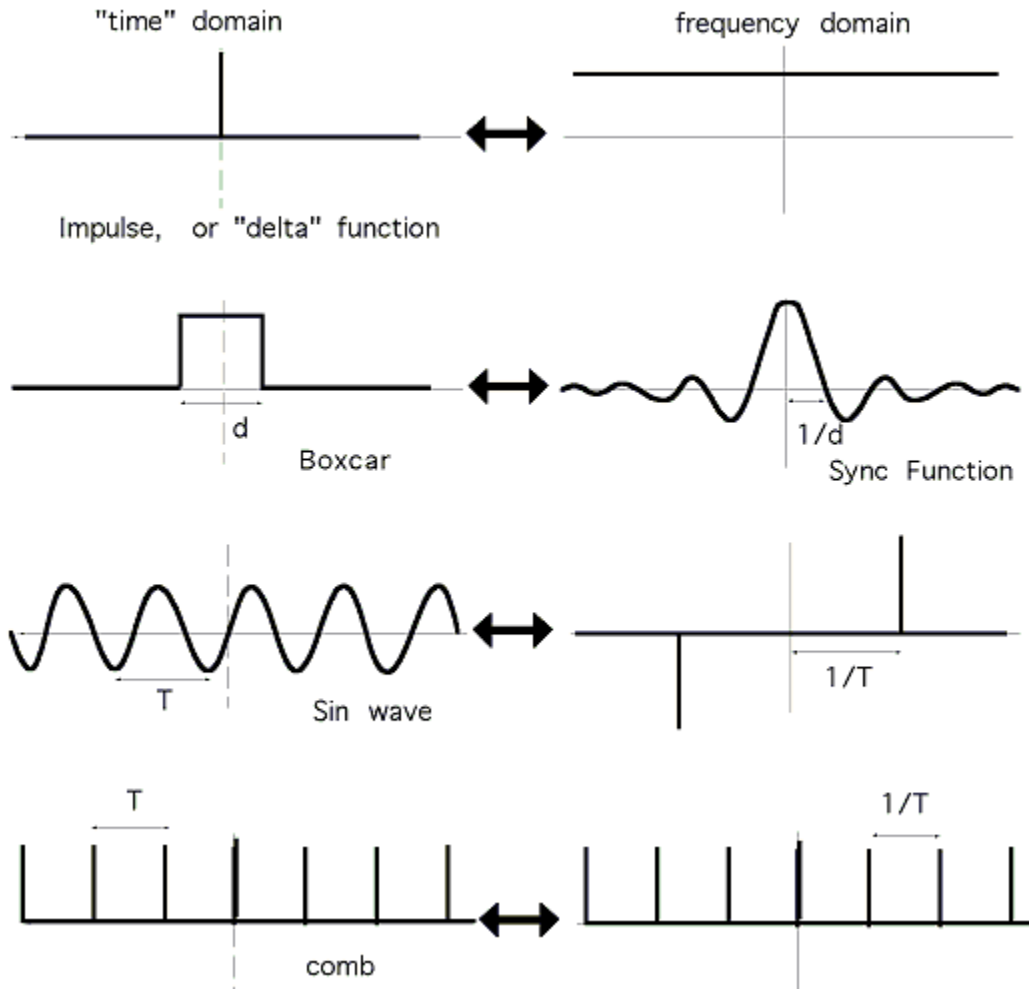


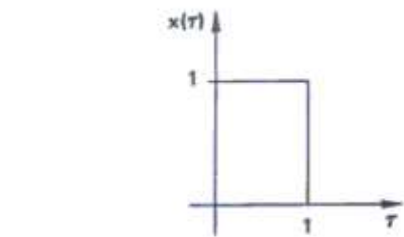
FIG. 1.1-3. The information from Figure 1.1-2 can be condensed into amplitude and phase spectra. Each point along the amplitude spectrum curve corresponds to the peak amplitude of the sinusoid at that frequency plotted as a trace in Figure 1.1-2. Note the equivalence of the two peaks in the amplitude spectrum with the two high-amplitude zones in Figure 1.1-2. Each point along the phase spectrum corresponds to the time delay of a peak or trough along the sinusoid at that frequency with respect to the timing line at $t = 0$. Note the equivalence of the phase curve with the trend of a positive peak from trace to trace in Figure 1.1-4.



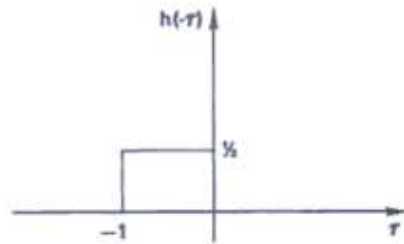




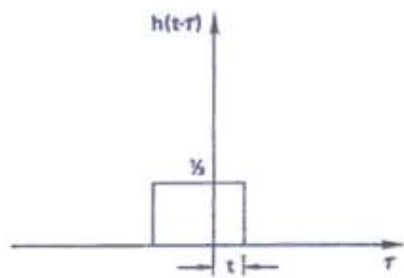




(a)



(b)



(c)

Figure 4.2 Graphical illustration of folding and displacement operations.

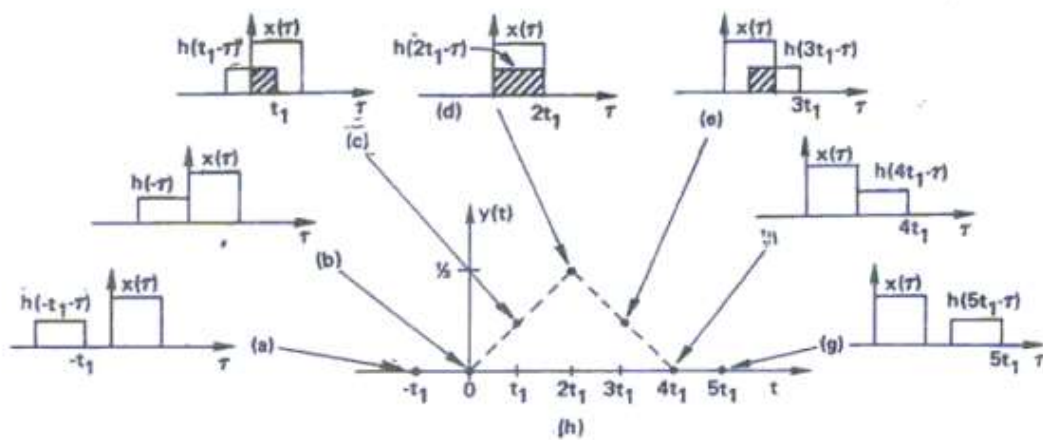


Figure 4.3 Graphical example of convolution; $t_1 = 1/2$.

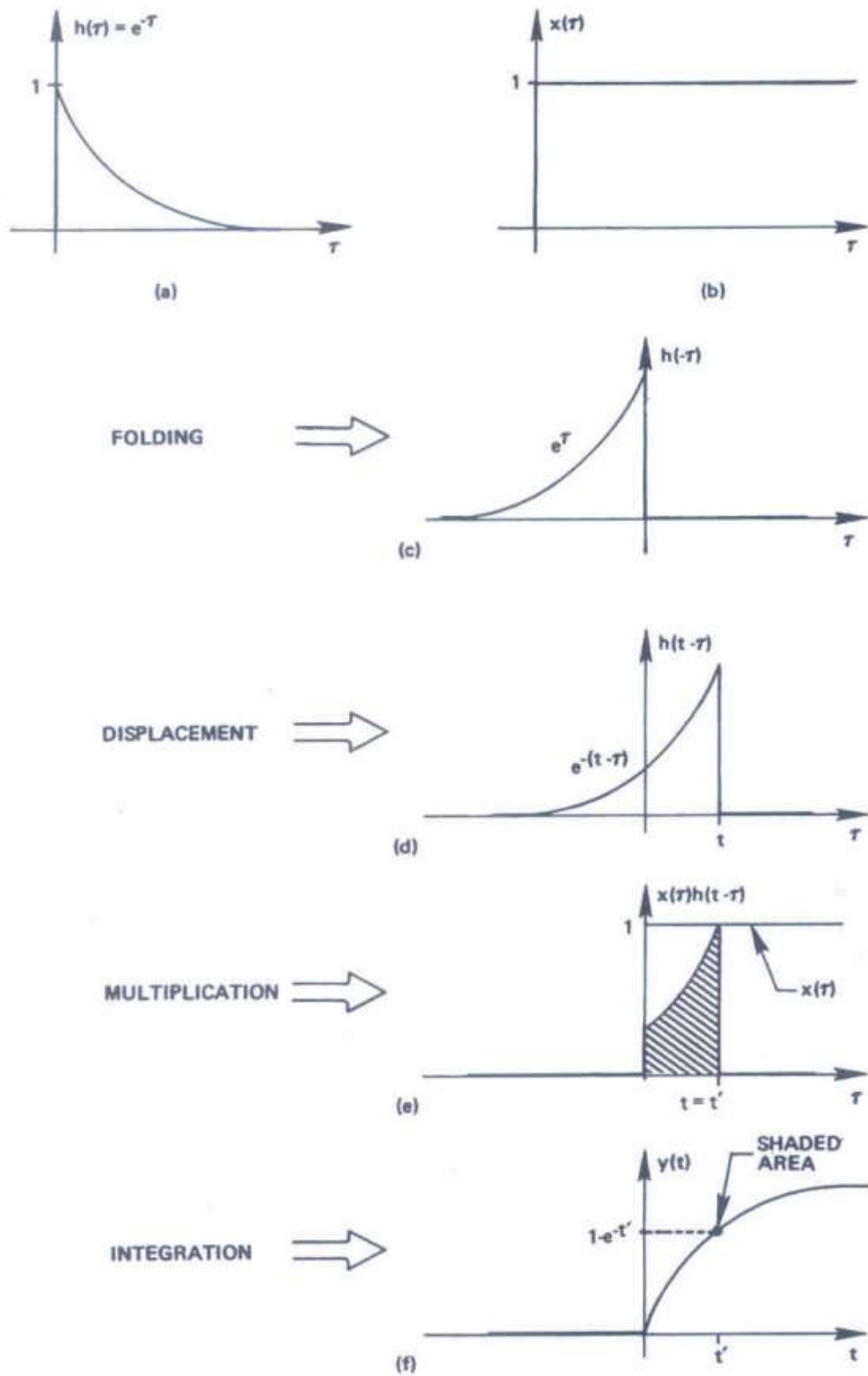
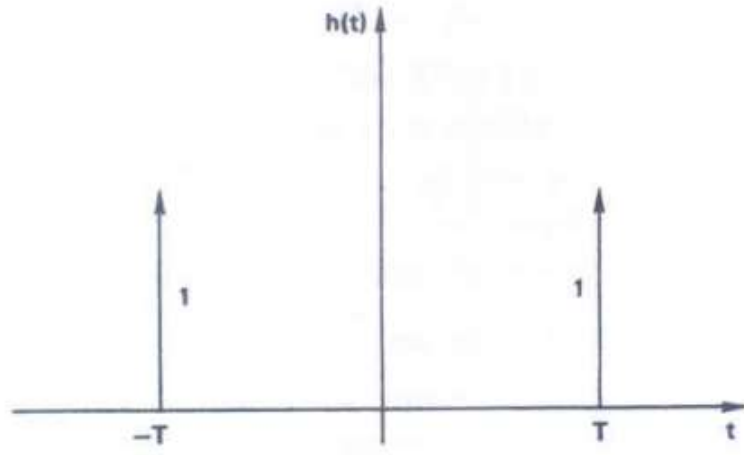
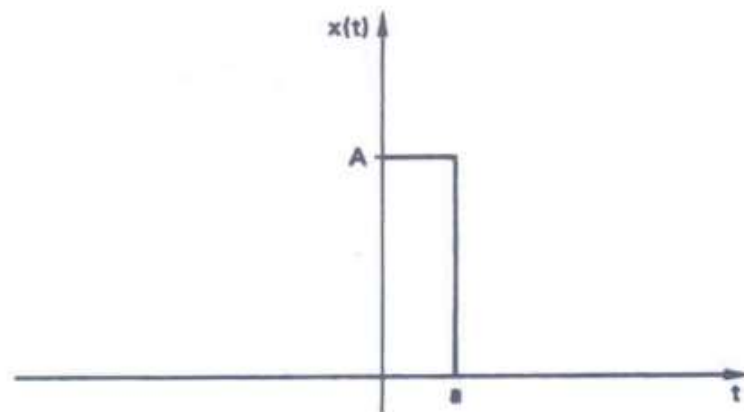


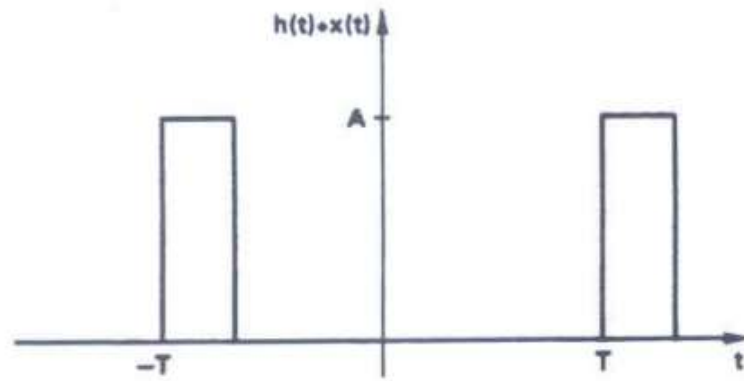
Figure 4.4 Convolution procedure: folding, displacement, multiplication, and integration.



(a)



(b)



(c)

Figure 4.6 Illustration of convolution involving impulse functions.

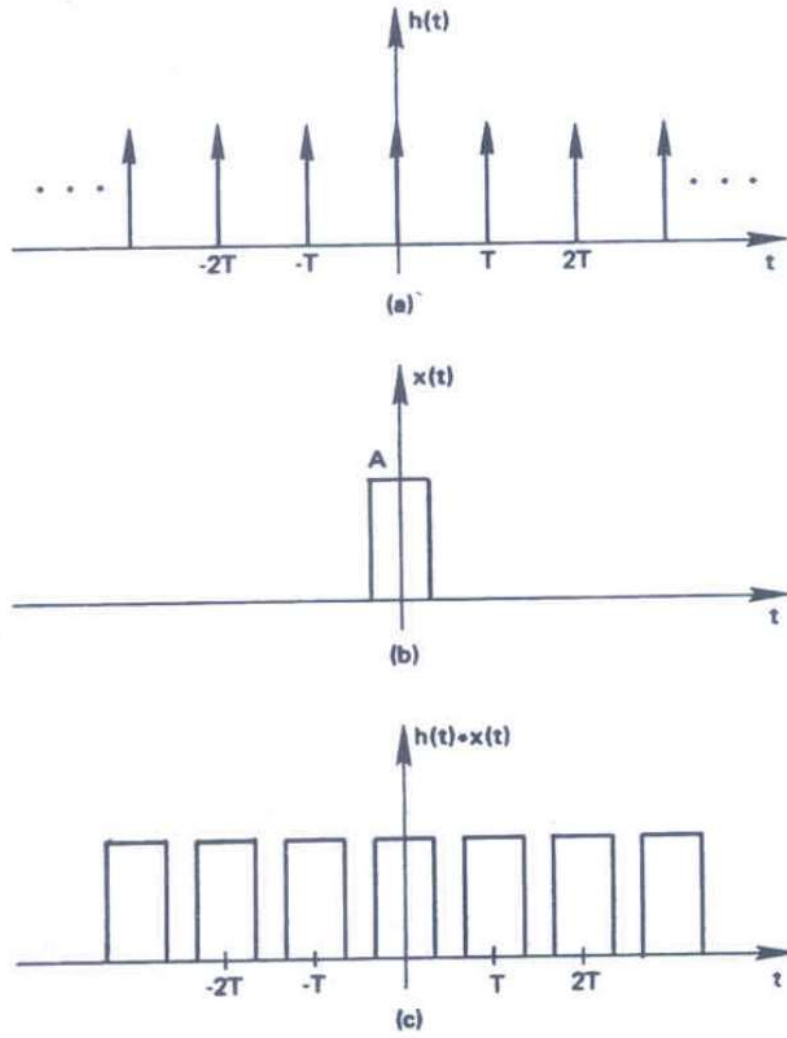


Figure 4.7 Convolution with an infinite sequence of impulse functions.

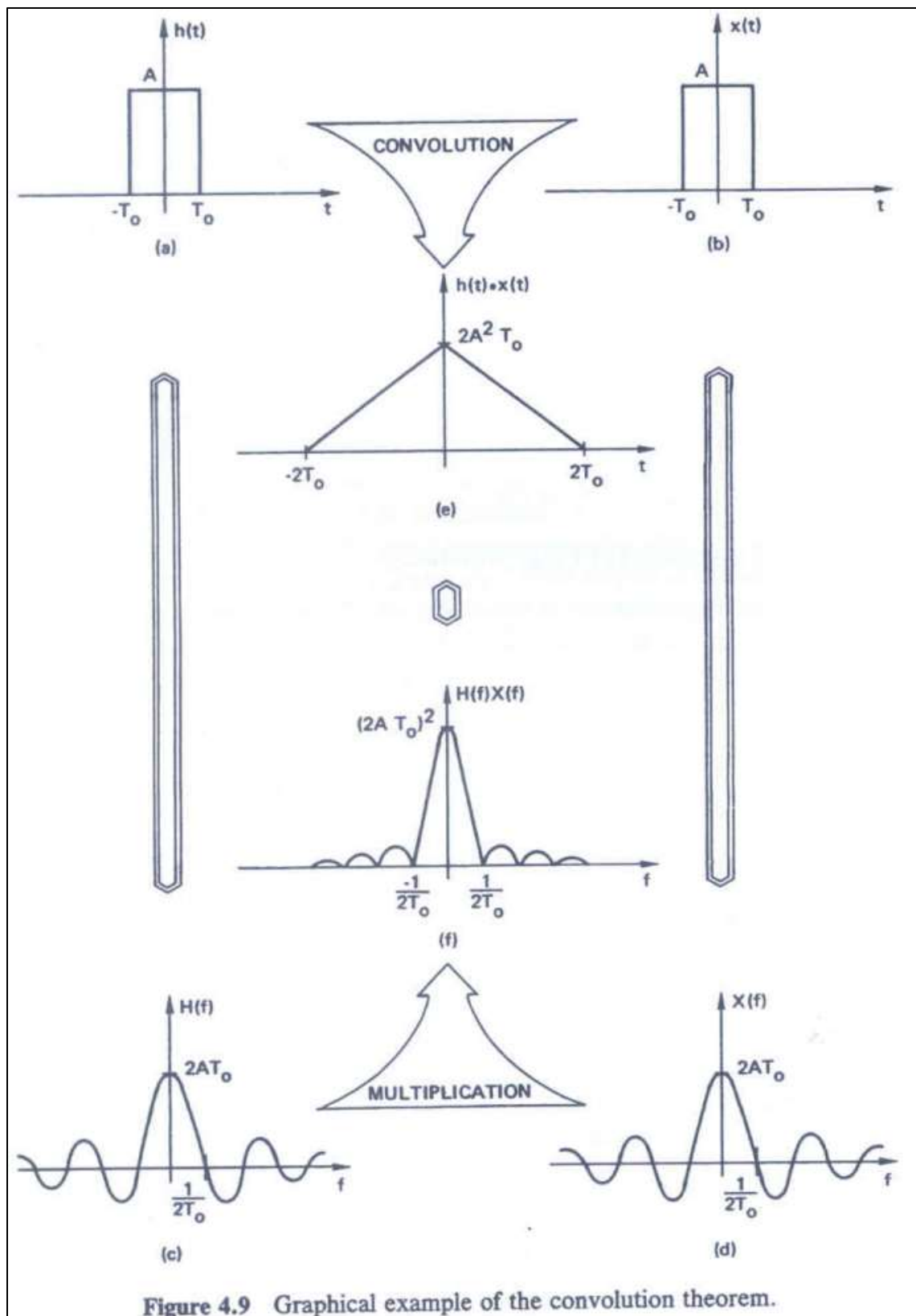


Figure 4.9 Graphical example of the convolution theorem.

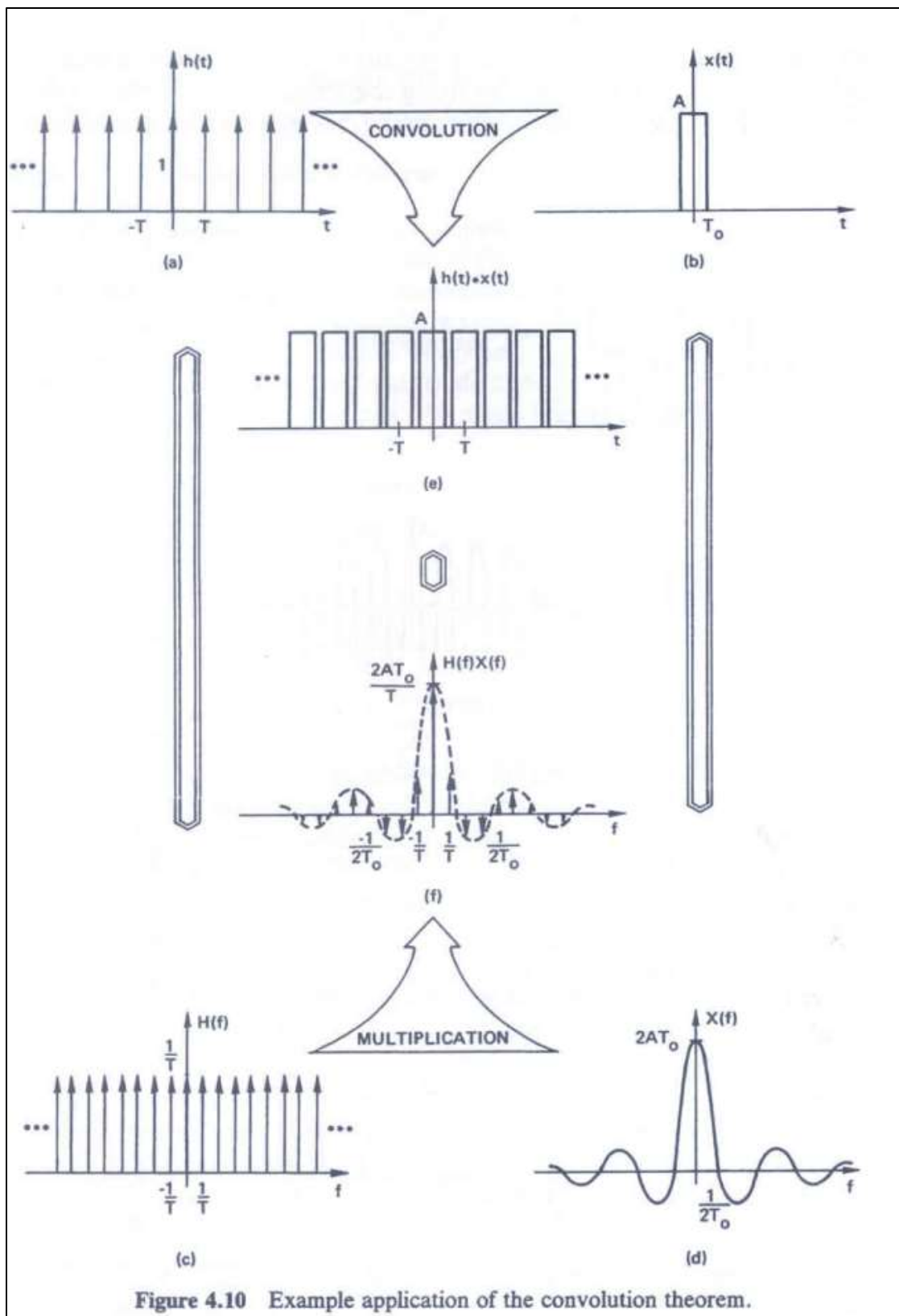


Figure 4.10 Example application of the convolution theorem.

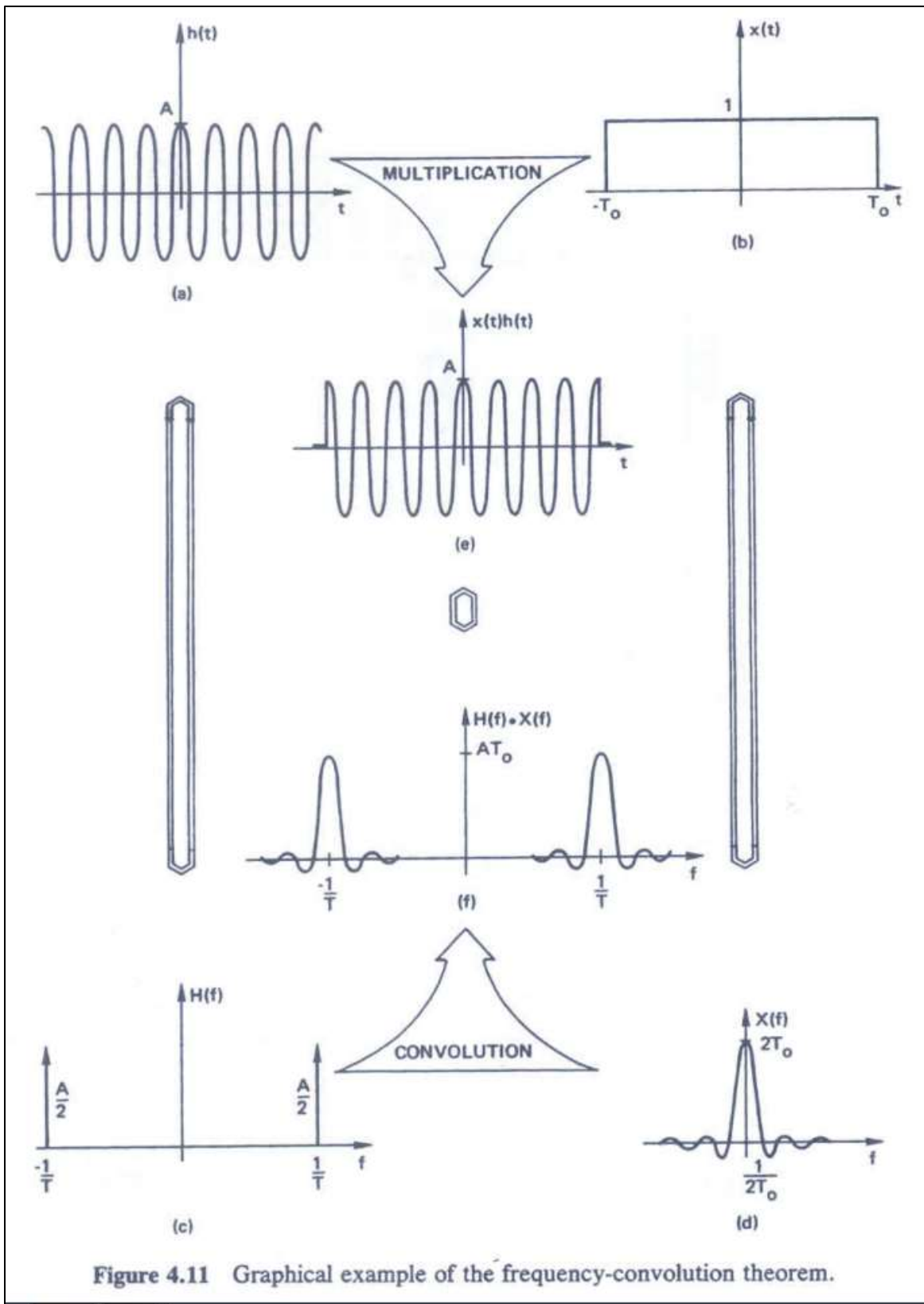
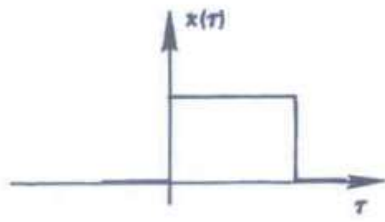
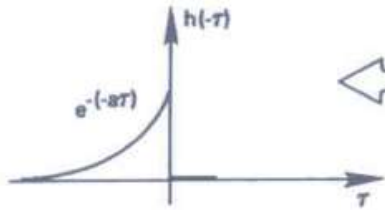
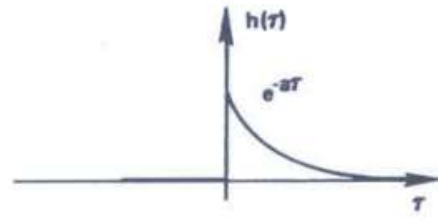


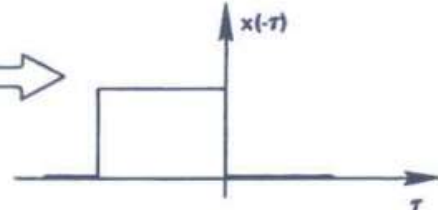
Figure 4.11 Graphical example of the frequency-convolution theorem.



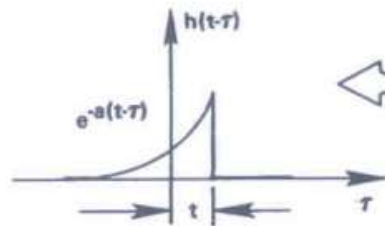
(a)



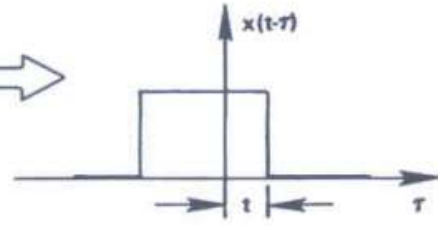
(b)



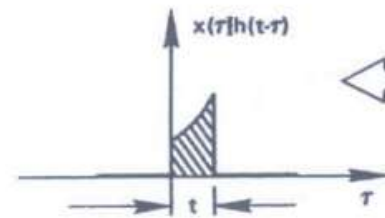
FOLDING



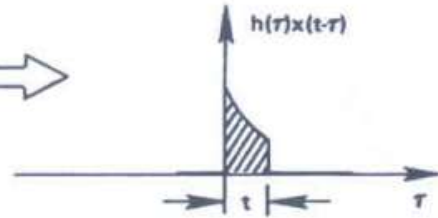
(c)



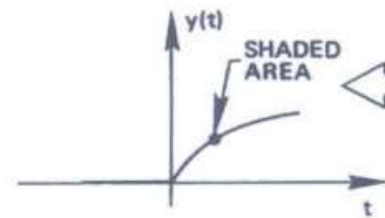
DISPLACEMENT



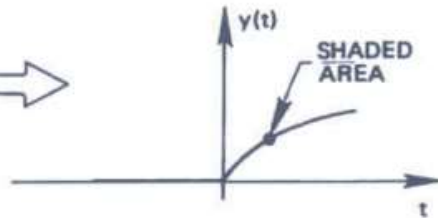
(d)



MULTIPLICATION



(e)



INTEGRATION

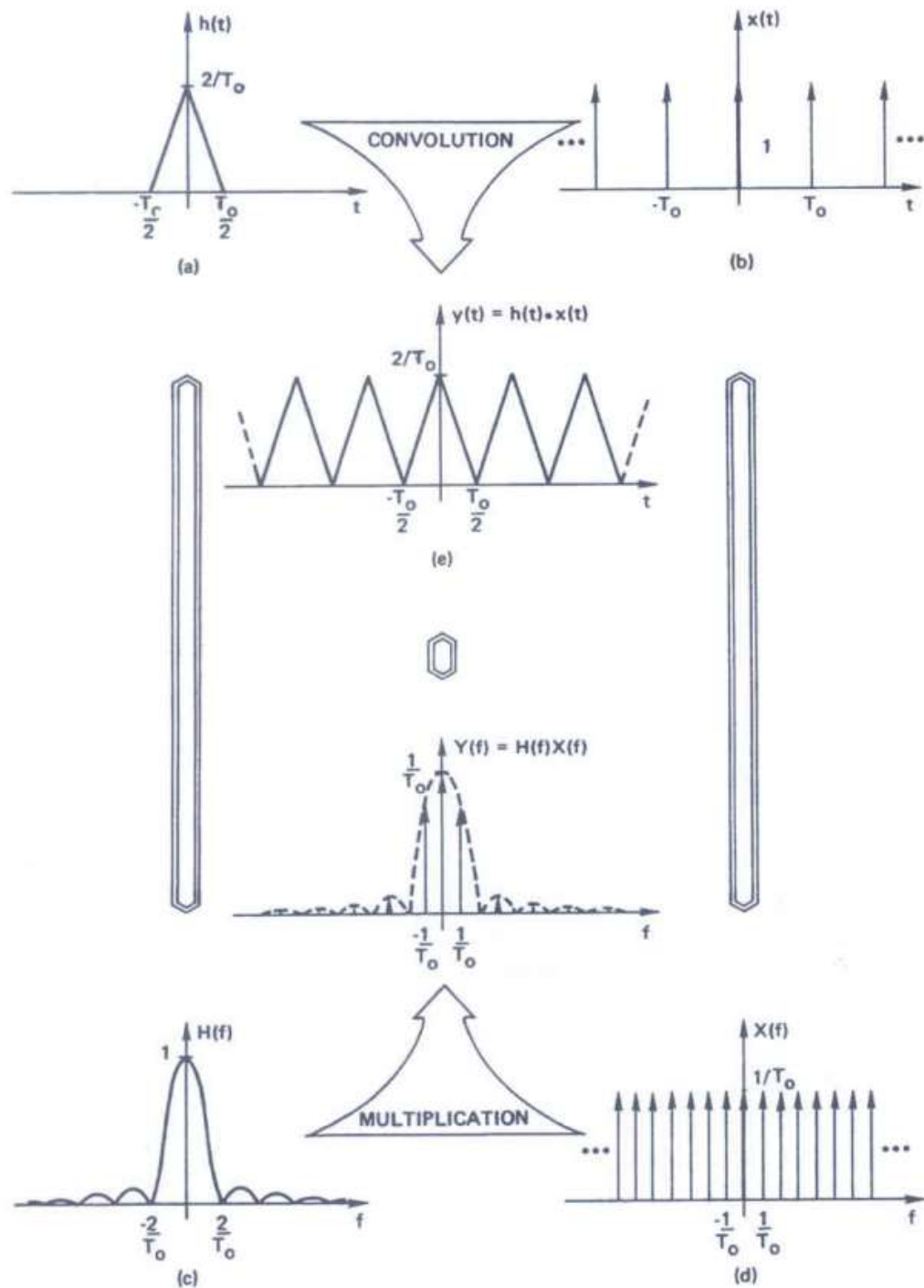
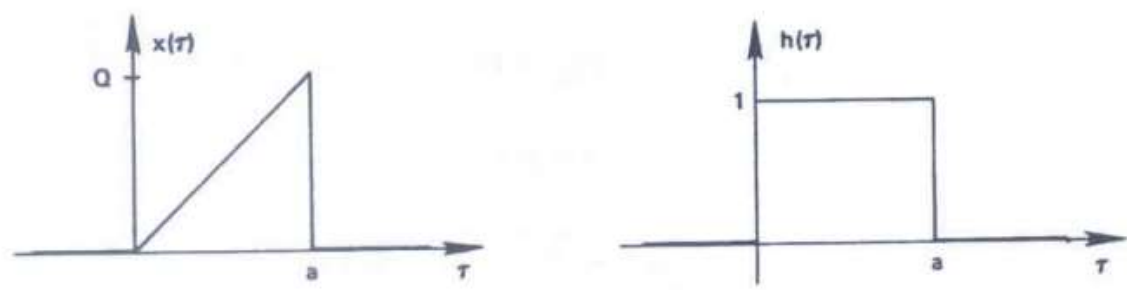
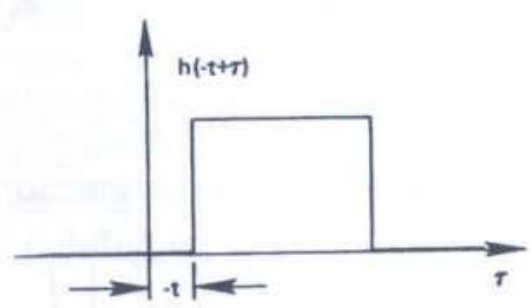


Figure 5.2 Graphical convolution theorem development of the Fourier transform of a periodic triangular waveform.



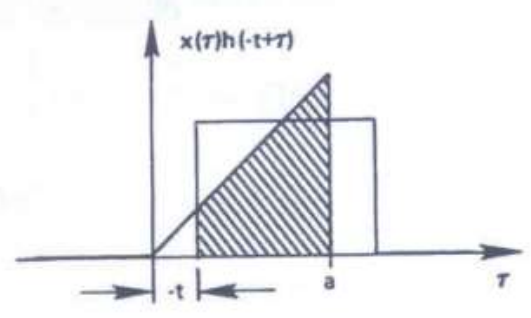
(a)

DISPLACEMENT



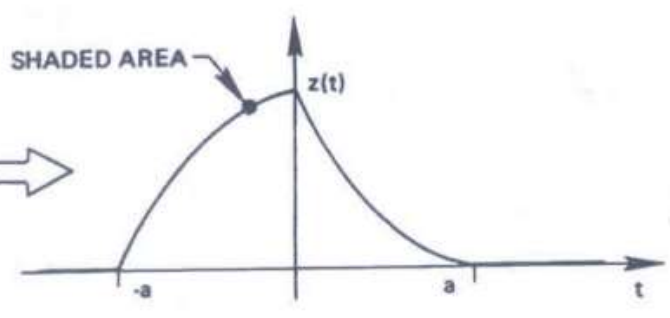
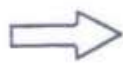
(b)

MULTIPLICATION



(c)

INTEGRATION



(d)

Figure 4.13 Correlation procedure: displacement, multiplication, and integration.

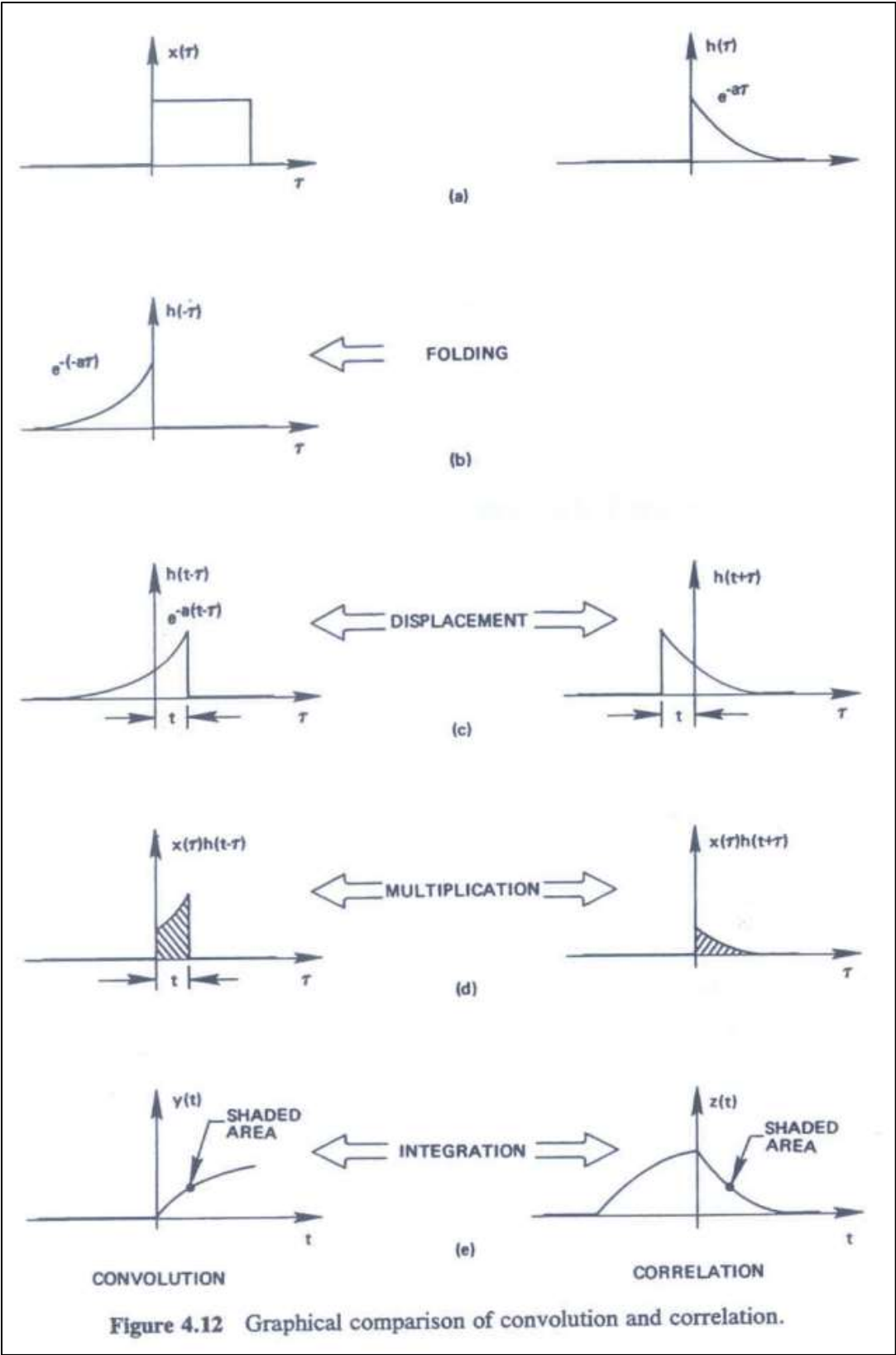
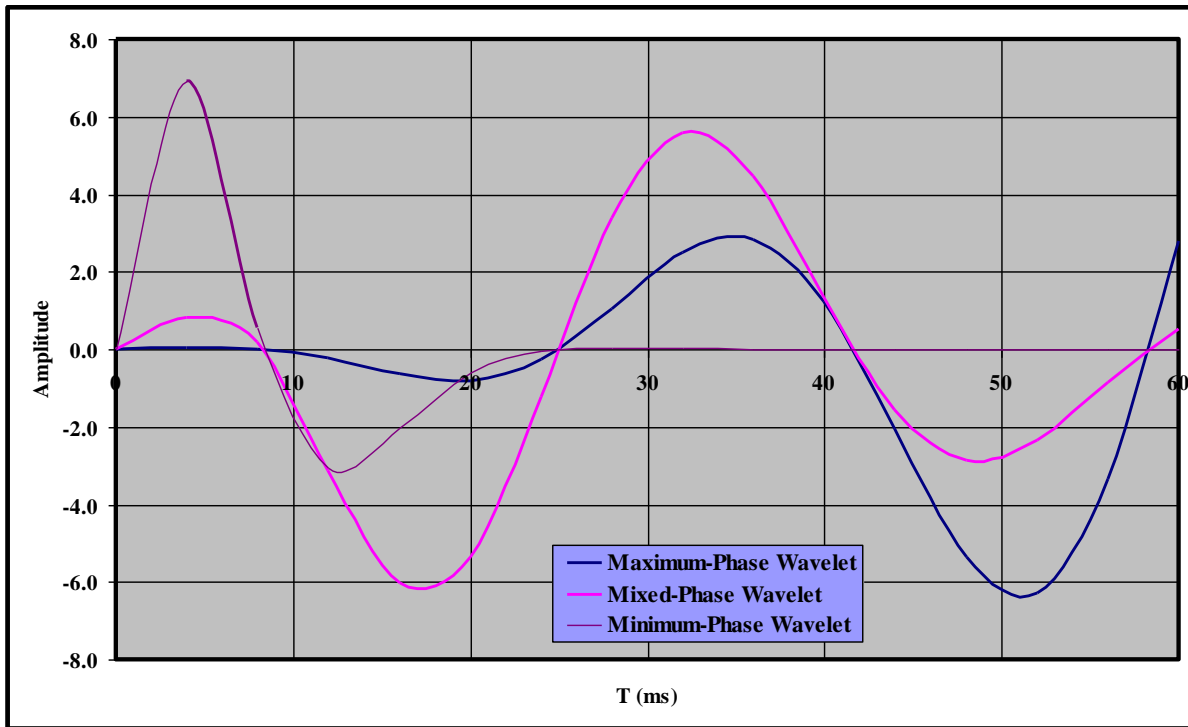
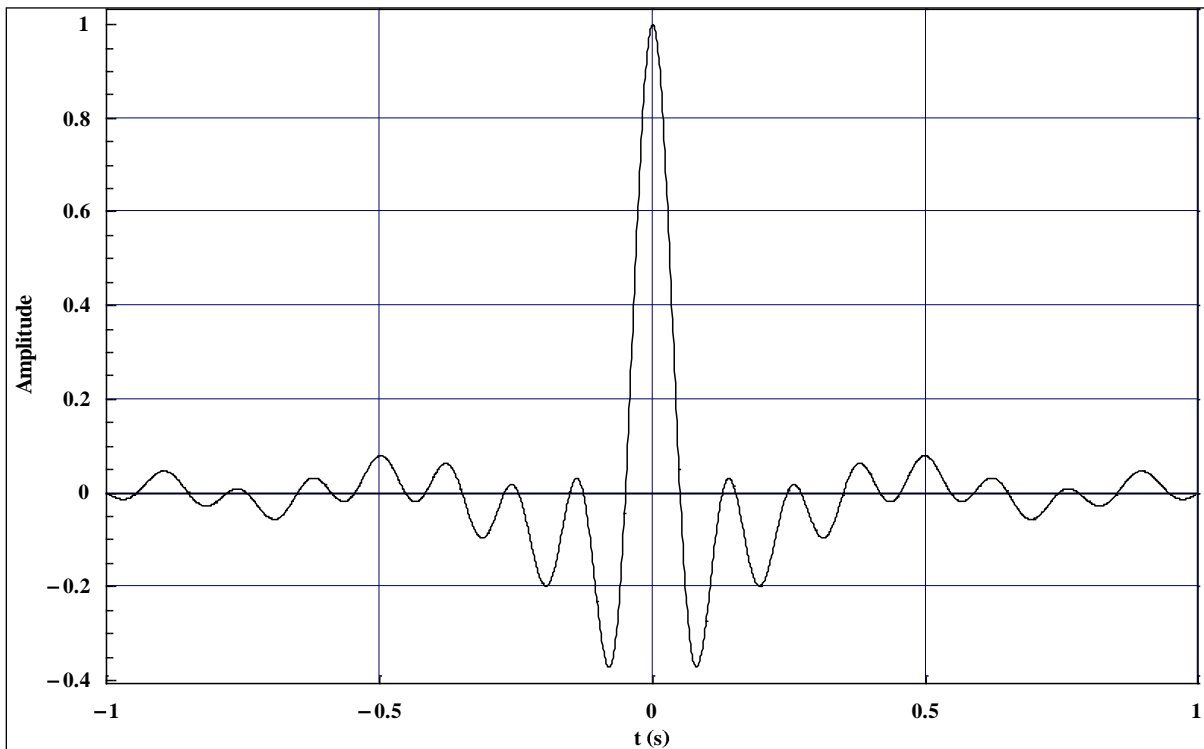


Figure 4.12 Graphical comparison of convolution and correlation.

Min-, max-, and mixed-phase wavelets



Zero-phase wavelet



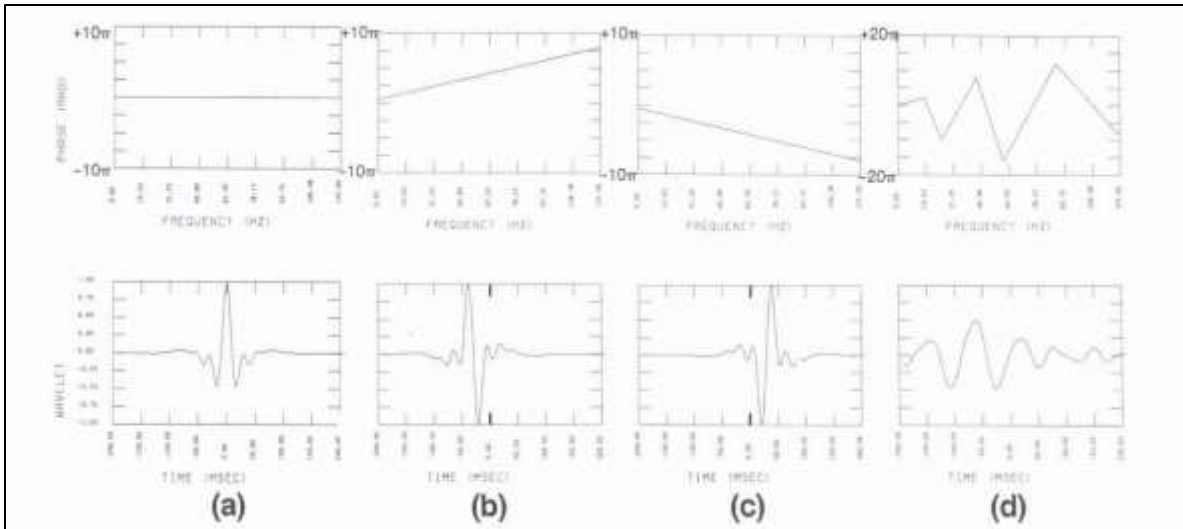


FIG. 1.1-18. The shape of a zero-phase wavelet (a) can be modified by introducing a nonzero-phase spectrum of any form as in (b), (c), and (d).

