



### Example 5-2: FIR convolution

For example, if  $h[n]$  is nonzero only in the interval  $0 \leq n \leq M$ , then (5.21) reduces to

$$y[n] = \sum_{\ell=n-M}^n x[\ell]h[n-\ell] \quad (5.22)$$

because the argument  $n-\ell$  must lie in the range  $0 \leq n-\ell \leq M$ , so the range for  $\ell$  in (5.21) is restricted to  $(n-M) \leq \ell \leq n$ . ■