

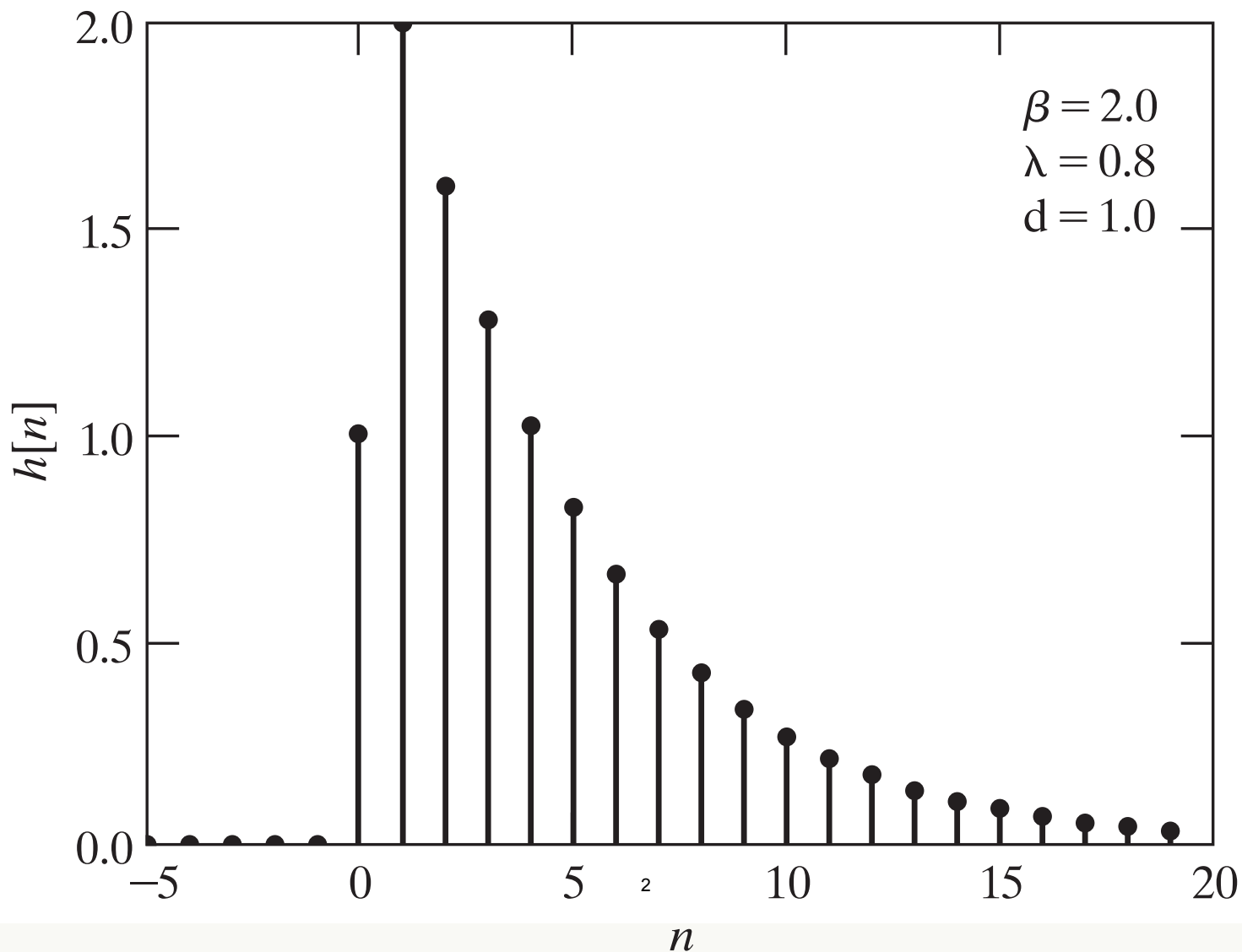
State-Space Models

6.011, Spring 2018

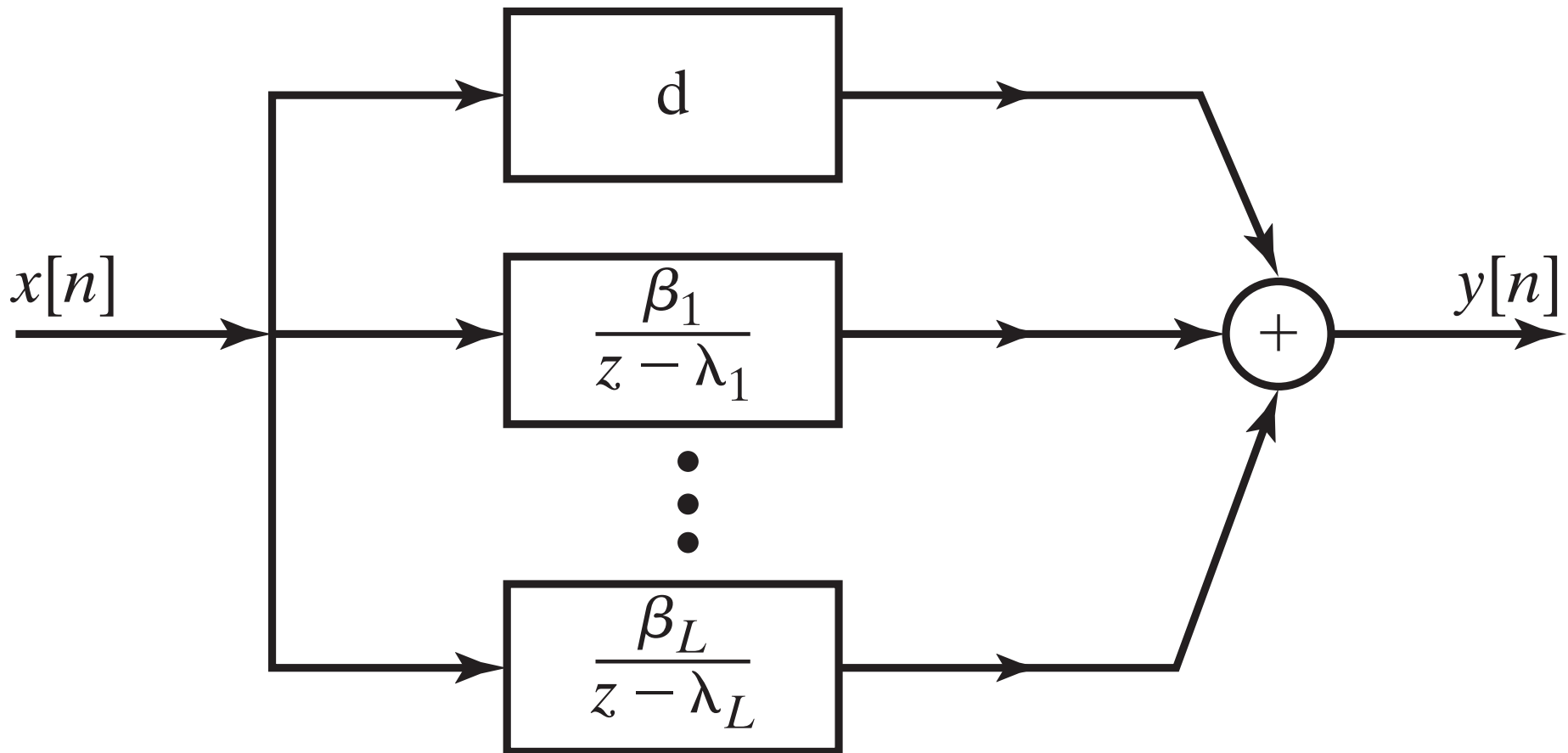
Lec 4

Exponential unit sample response

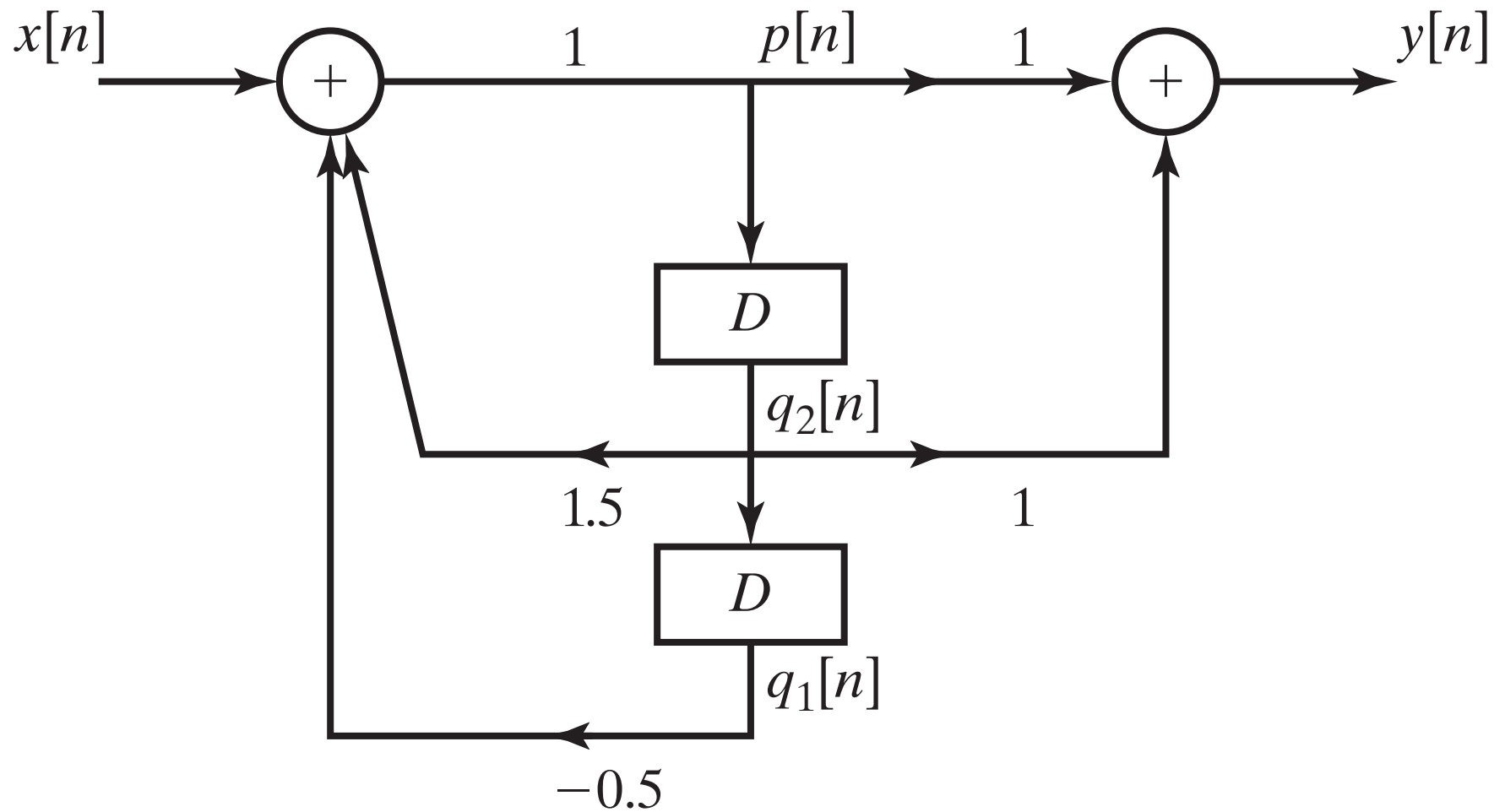
$$h[n] = \beta \lambda^{n-1} u[n-1] + d \delta[n]$$



General transfer function of a causal DT LTI system with distinct poles



Delay-adder-gain system



Defining properties of DT state-space models

$$\mathbf{q}[n + 1] = \mathbf{f}\left(\mathbf{q}[n], x[n], n\right)$$

$$y[n] = g\left(\mathbf{q}[n], x[n], n\right)$$

- **State evolution property**
- **Instantaneous output property**

MIT OpenCourseWare
<https://ocw.mit.edu>

6.011 Signals, Systems and Inference
Spring 2018

For information about citing these materials or our Terms of Use, visit: <https://ocw.mit.edu/terms>.