

$$x(n) = u(n) - u(n-6)$$

$$h(n) = (0.8)^n u(n)$$

$$y(n) = \sum_{k=0}^5 (1) (0.8)^{-(n-k)} u(n-k) = 0.8^n \sum_{k=0}^5 0.8^{-k} u(n-k)$$

Case I if $n < 0$ $u(n-k) = 0$, $0 \leq k \leq 5$
hence $y(n) = 0$

Case II $0 \leq n \leq 5$ $u(n-k) = 1$, $0 \leq k \leq n$

$$y(n) = 0.8^n \sum_{k=0}^n 0.8^{-k}$$

$$= 0.8^n \frac{1 - 0.8^{-(n+1)}}{1 - 0.8^{-1}} = 5(1 - 0.8^{n+1}), 0 \leq n \leq 5$$

Case III $n \geq 5$, $u(n-k) = 1$, $0 \leq k \leq 5$

$$y(n) = 0.8^n \sum_{k=0}^5 0.8^{-k}$$

$$= 0.8^n \frac{1 - 0.8^{-6}}{1 - 0.8^{-1}} = 5 \cdot 0.8^{n-5} (1 - 0.8^6), n \geq 5$$

