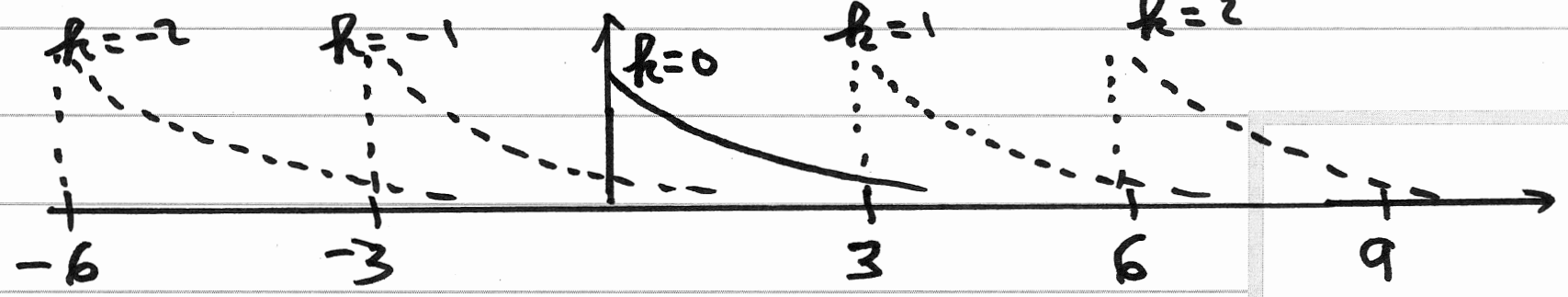
Prob. 2.12 $y(t) = e^{-t}u(t) * \sum_{k=-\infty}^{\infty} \delta(t-k3)$

Recall: $x(t) * \delta(t-T) = x(t-T)$

$$y(t) = \sum_{k=-\infty}^{\infty} e^{-(t-k3)}u(t-k3)$$

$$= e^{-t}\sum_{k=-\infty}^{\infty}(e^3)^k u(t-k3)$$



only $k \le 0$ contribute in $0 \le t < 3$:

$$y(t) = e^{-t}\sum_{k=-\infty}^{0}(e^3)^k$$

change of variables:

$k' = -k$

$$y(t) = e^{-t} \sum_{k'=\infty}^{0} (e^3)^{-k'} = e^{-t} \sum_{k'=0}^{\infty} \left(\frac{1}{e^3}\right)^{k'}$$

$$= e^{-t} \underbrace{\left(\frac{1}{1 - \frac{1}{e^3}}\right)}_{A}$$

answer