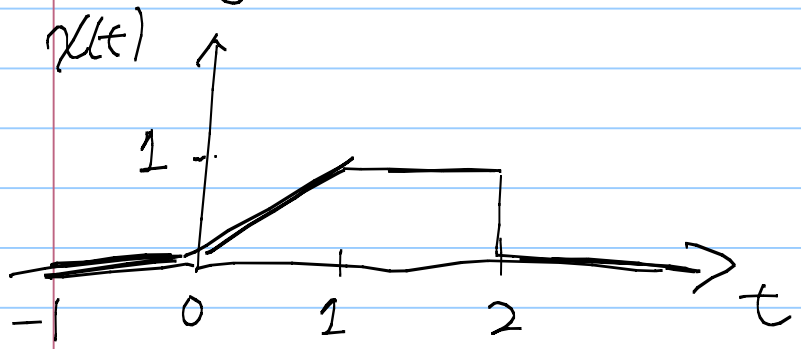
* Transformations of the time index

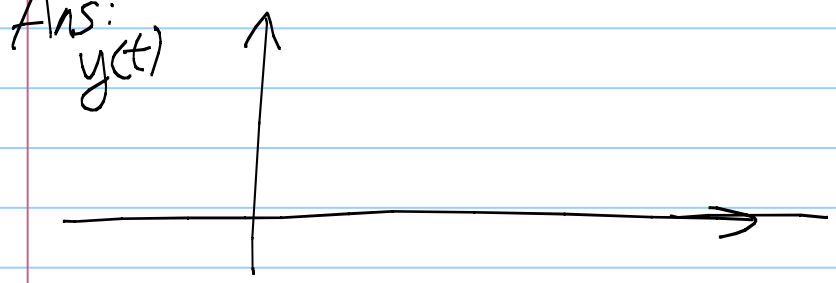
① Time-shift (DVR)

Q: For an $x(t)$ described by the following figure



let

Ans:

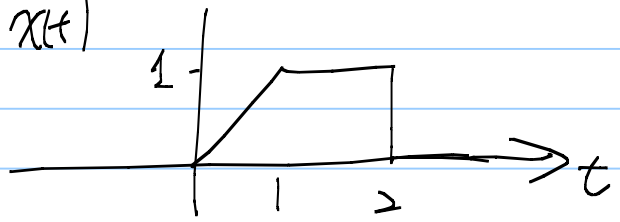


when "$t_0 > 0$", we say "shifted to the ____" "____" to seconds"

When $t_0 < 0$, we say "shifted to the ____" "____" to second

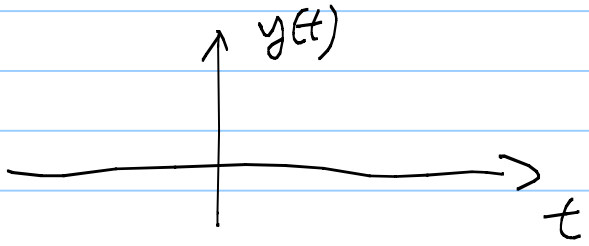
② Time-reversal (play backward)

Q: Given the same $x(t)$



let plot $y(t)$ vs. t.

Ans:

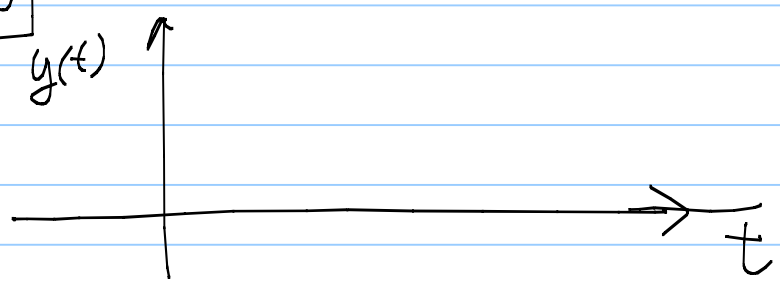


③ Time-scaling

Q: Given the same $x(t)$, let where $\alpha > 0$. Plot $y(t)$ vs. t for $\alpha = 2$ and $\alpha = 0.5$ respectively.

Ans: $\alpha = 2$

$\alpha = 0.5$



Note Title

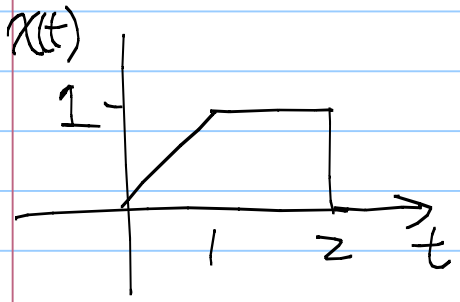
8/28/2014

Composite Transformation

Q: Given the same $x(t)$, let

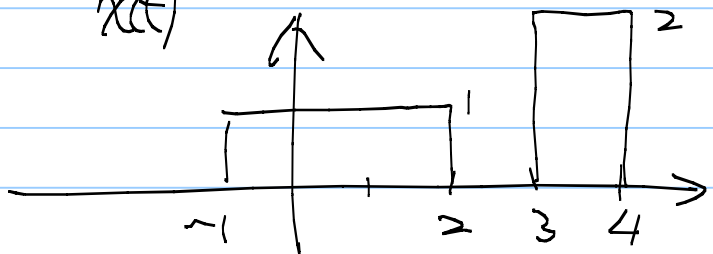
$y(t) = 2 \cdot x(2-3t)$.

Plot $y(t)$ vs. t.



Tip:

Exercise: Given $x(t)$ being



Plot $y(t) = \frac{1}{3} x(4 - 0.5t)$.

Ans:

Prof. Balakrishnan's handout.

* Classification #3: By the period.

* We say $x(t)$ is a periodic signal with **period T** if we let $y(t) = x(t-T)$ be the shifted version of $x(t)$, then the new signal "looks" exactly like the old signal: sometimes we just write

For DT: