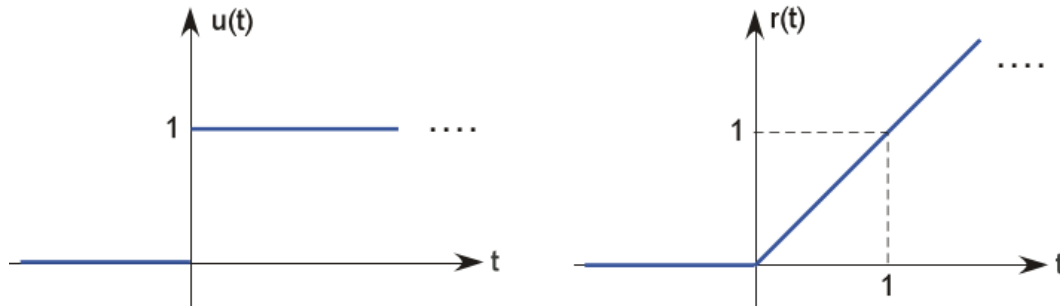


Superposition Exercises

The **due date** for this homework is **Sun 14 Apr 2013 8:00 PM EDT**.

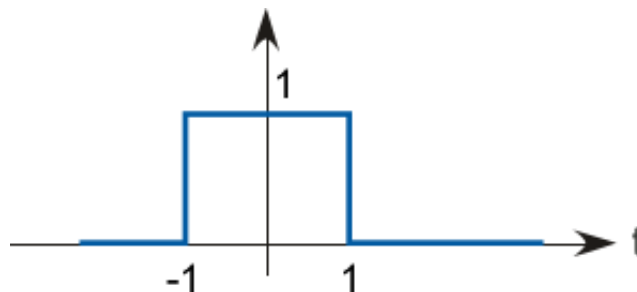
What follows are a set of ungraded exercises to test your ability to construct complicated signals by the superposition of weighted and delayed unit-step $u(t)$ and ramp $r(t)$ signals.



The key to "seeing" the superposition is to scan the signal from left to right and focus on the times when amplitude changes occur (must be a step equal to the size of the discontinuity there) and when slope changes occur (must be a ramp there having a gain equal to the slope change).

Question 1

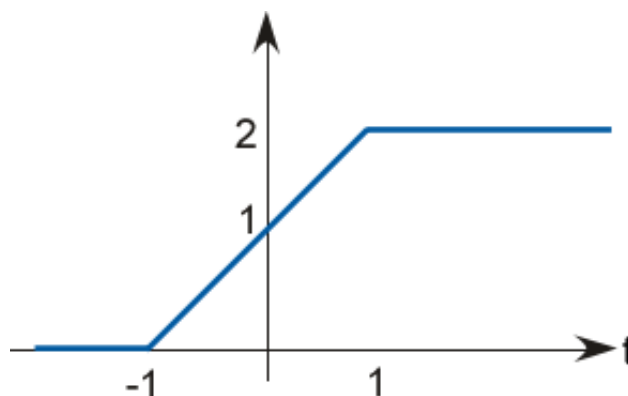
Express the depicted signal as a superposition of unit-step $u(t)$ and ramp $r(t)$ signals.



- ☐ $u(t + 1) - 2u(t - 1)$
- ☐ $u(t - 1) - 2u(t - 1)$
- ☐ $u(t + 1) - u(t - 1)$

Question 2

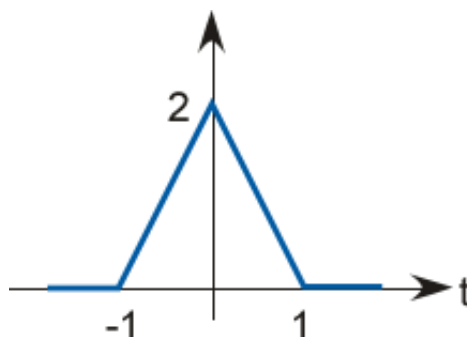
Express the depicted signal as a superposition of unit-step $u(t)$ and ramp $r(t)$ signals.



- ☐ $r(t + 1) - u(t - 1)$
- ☐ $r(t + 1) - r(t - 1)$
- ☐ $r(t + 1) - 2r(t - 1)$

Question 3

Express the depicted signal as a superposition of unit-step $u(t)$ and ramp $r(t)$ signals.



- ☐ $2r(t + 1) - 2r(t)$
- ☐ $2r(t + 1) - 2r(t) + r(t - 1)$
- ☐ $2r(t + 1) - 4r(t) + 2r(t - 1)$

Question 4

Express the depicted signal as a superposition of unit-step $u(t)$ and ramp $r(t)$ signals.



- ☐ $r(t) - r(t - 1)$
- ☐ $r(t) - u(t - 1)$
- ☐ $r(t) - r(t - 1) - u(t - 1)$

☐ In accordance with the Honor Code, I certify that my answers here are my own work.

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