

- You have 50 minutes to work the following four problems.
  - Be sure to show all your work to obtain full credit.
  - The exam is closed book and closed notes.
  - Calculators are permitted.
1. (25 pts.) Consider the system with input  $x[n]$  and output  $y[n]$  defined by the relationship

$$y[n] = \sum_{k=n-5}^{n+5} x[k]$$

For each property below, prove that it either holds or does not hold for this system.

- (7) a. Linearity
- (7) b. Time-invariance
- (4) c. Causality
- (7) d. Stability