University of Nebraska-Lincoln
Digital Signal Processing: Quiz 4

September 26, 2025

Name: _____   **Total Points: 10**

Given: A linear time-invariant (LTI) system has the impulse response:

$$h[n] = (0.8)^n u[n] - (0.5)^n u[n-3]$$

where $u[n]$ is the unit step function.

1. **(5 points)** Determine if this system is **stable**. Show your work and justify your answer using the appropriate stability criterion for discrete-time LTI systems.

2. **(5 points)** Determine if this system is **causal**. Show your work and justify your answer using the appropriate causality criterion for discrete-time LTI systems.