

**Anderson, Douglas R.**

**Solutions to second-order three-point problems on time scales.** (English) Zbl 1021.34011  
*J. Difference Equ. Appl.* 8, No. 8, 673-688 (2002).

The author applies a fixed-point theorem in a cone to establish existence criteria for multiple positive solutions to the nonlinear second-order boundary value problem (with mixed derivatives) on time scales

$$u^{\Delta\nabla}(t) + f(t, u(t)) = 0, \quad u(0) = 0, \quad \alpha u(\eta) = u(T),$$

$t \in [0, T] \subseteq \mathbb{T}$ . Here,  $\mathbb{T}$  is a time scale (nonempty closed subset of  $\mathbb{R}$ ),  $\Delta$  and  $\nabla$  are the delta-derivative and the nabla-derivative, respectively. Two main results are sufficient conditions for the existence of at least three positive solutions to the given dynamic boundary value problem, and the existence of at least one positive solution to a certain related problem.

Reviewer: [Roman Hilscher \(East Lansing\)](#)

**MSC:**

- 34B10** Nonlocal and multipoint boundary value problems for ordinary differential equations  
**39A10** Additive difference equations

Cited in **80** Documents

**Keywords:**

[time scale](#); [positive solution](#); [fixed-point theorem](#)