What is the relationship between the mass of a damped spring-block oscillator and the damping ratio?

Physics HL

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1 Introduction

This essay extends the investigation of simple harmonic motion by studying the damping force of a damped oscillator submerged in water, aiming to scrutinize the relationship between the mass of the block and the damping ratio. By scrutinizing this relationship, the study aims to offer valuable insights that can inform the design of systems seeking to optimize damping levels for safety-related objectives.

1.1 The Research Question

What is the relationship between the mass of a damped spring-block oscillator and the damping ratio?