

1035-W1-65

Charles W. Groetsch* (charles.groetsch@citadel.edu), School of Science and Mathematics,
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Analysis.*

An elementary physical model, based on Torricelli's law, can be used as a motivator for topics in intermediate level mathematical analysis courses. The particular mathematical topics that arise from the model involve the implicit function theorem and related issues. The model provides a concrete setting for highlighting the necessity of investigating the existence and character of implicitly defined functions, and serves as a platform for the use of graphical and numerical means to guide rigorous analysis. The analysis of the mathematical model relies on implicit differentiation and a simple fixed point theorem. (Received July 06, 2007)