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Nonhomogeneous Linear Second Order Differential Equations and Resonance through Geogebra Program

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Abstract : The aim of this work is the application of the program GeoGebra in teaching the study of nonhomogeneous linear second order differential equations with constant coefficients. Different kind of functions or forces will be considered in the right hand side of the differential equations, in particular, the emphasis will be placed in the case of trigonometrical functions producing the resonance phenomena. In order to obtain this, the frequencies of the trigonometrical functions will be changed. Once the resonances appear, these have to be correlationated with the roots of the second order algebraic equation determined by the coefficients of the differential equation. In this way, the physics and engineering students will understand resonance effects and its consequences in the simplest way. A large variety of examples will be shown, using different kind of functions for the nonhomogeneous part of the differential equations.

Keywords : education, geogebra, ordinary differential equations, resonance
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