

Mohameden, Ahmed. 2008. Solving initial-value second order ordinary differential equations on an Excel© spreadsheet. *MSOR Connections*. 8(4): November 2008 – January 2009. 21-25.

https://www.researchgate.net/publication/275380254_MS_ExcelC_for_higher_maths_Solving_initial-value_second_order_ordinary_differential_equations_on_an_ExcelC_spreadsheet .

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Abstract: This paper presents a friendly method of solving initial-value second order differential equations (DEs) analytically on a MS Excel© workbook. Upon entering the constant coefficients and boundary conditions, the type of solution is highlighted and the user can visualize the full solution accompanied by a graphical representation, on a mouse click. Graphical artefacts and data misrepresentation have been explored and remedial procedures recommended. This tool is designed to help engage students and contribute in tackling the rather familiar “maths problem” to many lecturers today. It is also intended as a help to academics wishing to generate DEs for teaching and assessment purposes; in addition to being a handy aid to simulation and development engineers. Parameters can be varied and equations with solutions saved on a separate worksheet for future use. There is room for customizing this solver to adopt user’s terminology. This present version is the first and it has been restricted to equations of the type:

$$ay'' + by' + cy = R\sin(\omega t + \phi)$$

where a, b, c, R, ω and ϕ are all constants and b or R can be zero.

Keywords: differential equations, solution, spreadsheet, Excel, numerical