

**UNIVERSITI TEKNOLOGI MARA**

**TECHNICAL REPORT**

**IMPLICIT EULER METHOD FOR SOLVING  
ORDINARY DIFFERENTIAL EQUATIONS**

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## ABSTRACT

The differential equations (DE) is an equation that is an unknown equation that contains not only the functions but also its derivatives. The equation will become an ordinary differential equation (ODE) if it contains one or more derivatives and independent variables of its function. The ordinary differential equations (ODE) can be solve analytically and numerically. However, not all ordinary differential equations (ODE) can be solve analytically. Because the analytical methods only gives the exact solution while the numerical methods can solve the ordinary differential equations (ODE) by giving the approximation solution. In this study, it was conducted to solve the first order of five (5) problems ordinary differential equations (ODE) by using Implicit Euler method (IEM) and to compare the results of exact solution and proposed method with different step sizes. There are several steps in order to determine the result which are starting with the Implicit Euler method formula, and then state the ODE equations, implimentation of the method and calculation of absolute error. The MAPLE software are used to help us to solve the problems and get the results. The best solution can be achieved when the step size is smaller. From all the five problems, the results show when the value of step size and the absolute error is small, the accuracy will become higher.