

Written HW26 – MATH 2502 Spring 2021

Due by 19 November for timely completion credit

We investigated series solutions of differential equations by taking derivatives of the “guess” $y(t) = \sum_{k=0}^{\infty} a_k t^k$ and substituting them into the differential equation to get a recurrence relation for the sequence a_0, a_1, a_2, \dots . In this homework you will do the same.

In each of the following problems, find the first five **nonzero** terms of the series for $y(t)$ of the given differential equation with the given initial values of the sequence a_0, a_1, \dots .

1. A spring-mass model obeys $y''(t) - 2y'(t) + 5y(t) = 0$; use $a_0 = 1$ and $a_1 = 2$.
2. A Weber differential equation is given by $y''(t) - t^2y(t) = 0$; use $a_0 = 3$ and $a_1 = 5$.