

Solving nonhomogeneous linear DEs via variation of parameters

Given the two solutions y_1 and y_2 of the underlying homogeneous linear differential equation, we consider the formulas

$$u_1' = -\frac{y_2 f(x)}{W}, \quad u_2' = \frac{y_1 f(x)}{W},$$

where W is the Wronskian $W(y_1, y_2)$. Once we obtain these, we then integrate to find u_1 and u_2 . The needed particular solution is then given by

$$y_p = u_1 y_1 + u_2 y_2.$$

Discussion, comments, and examples:



Math45-Module-14-Video-01

WeBWorK module 14 exercises:

- Problems 1, 2, 3

Relevant Wikipedia articles:

- [Variation of parameters](https://en.wikipedia.org/wiki/Variation_of_parameters#General_second-order_equation) 
(https://en.wikipedia.org/wiki/Variation_of_parameters#General_second-order_equation)