Reduction of order purpose and process

This method works for a second order homogeneous linear differential equation. We work through an example in the video in a general way. However, here we only provide the solution.

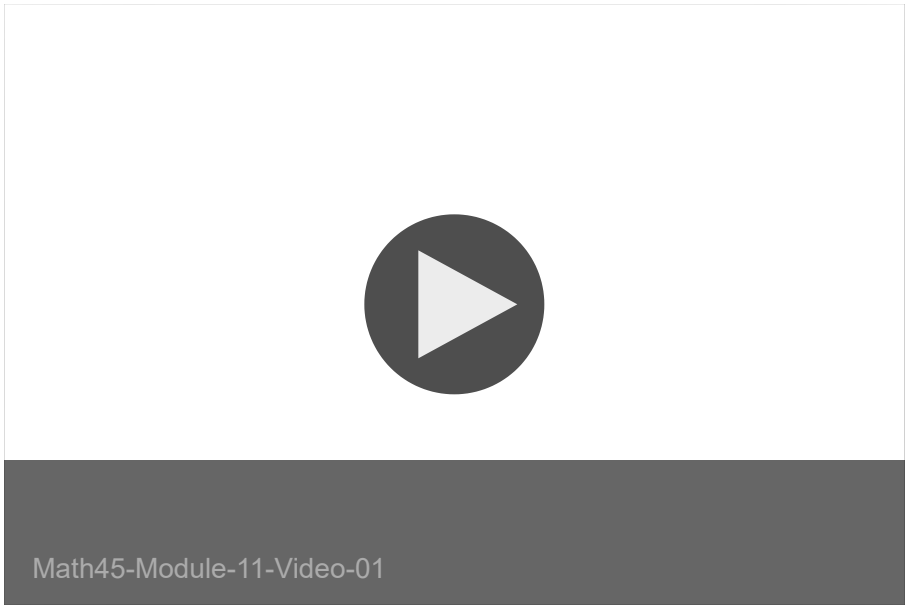
In particular, suppose we are given the differential equation

$$y'' + P(x)y' + Q(x)y = 0,$$

where $P(x)$ and $Q(x)$ are functions of x. Additionally, suppose that $y_1(x)$ is a solution to this differential equation. Then another--linearly independent--solution for this differential equation is given by

$$y_2(x) = y_1(x) \int \frac{e^{-\int P(x)\,dx}}{y_1(x)^2}\,dx.$$

Discussion, comments, and examples:



WeBWorK module 11 exercises:

- Problems 1, 2

Relevant Wikipedia articles:

- Reduction of order (https://en.wikipedia.org/wiki/Reduction_of_order)