

4.2 Reduction of Order

Supplemental Instruction
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In the following problems $y_1(x)$ is a solution of the given differential equation. Use reduction of order to find a second solution $y_2(x)$.

a. $y'' + 16y = 0$; $y_1 = \cos 4x$

b. $y'' - 4y' + 4y = 0$; $y_1 = e^{2x}$

c. $9y'' - 12y' + 4y = 0$; $y_1 = e^{2x/3}$

d. $x^2y'' - 7xy' + 16y = 0$; $y_1 = x^4$

e. $xy'' + y' = 0$, $y_1 = \ln x$

f. $x^2y'' - xy' + 2y = 0$, $y_1 = x \sin(\ln x)$

g. $(1 - 2x - x^2)y'' + 2(1 + x)y' - 2y = 0$, $y_1 = x + 1$