

Variation of Parameters

1. For the differential equation $y'' - 2y' - 3y = x + 2$,

(a) Solve the complementary equation.

(b) Use the equations

$$u' = \frac{-Gy_2}{a(y_1y_2' - y_2y_1')} \text{ and } z' = \frac{Gy_1}{a(y_1y_2' - y_2y_1')}$$

to find u' and z' .

(c) Integrate u' and z' to get a particular solution for the differential equation.

(d) Write down the general solution of the differential equation.