

VARIATION OF PARAMETERS - If $y_1(t)$ and $y_2(t)$ form a FSS to the homogeneous equation $y'' + p(t)y' + q(t)y = 0$, then a particular solution $y_p(t)$ of the nonhomogeneous equation

$$y'' + p(t)y' + q(t)y = g(t) \quad (*)$$

has the form $y_p(t) = u_1(t)y_1(t) + u_2(t)y_2(t)$, where

$$u_1' = \frac{\begin{vmatrix} 0 & y_2 \\ g(t) & y_2' \end{vmatrix}}{\begin{vmatrix} y_1 & y_2 \\ y_1' & y_2' \end{vmatrix}}, \quad u_2' = \frac{\begin{vmatrix} y_1 & 0 \\ y_1' & g(t) \end{vmatrix}}{\begin{vmatrix} y_1 & y_2 \\ y_1' & y_2' \end{vmatrix}}.$$

Remember: Coefficient of y'' in (*) must be “1” in order to use the above formulas.