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$$W = \begin{vmatrix} y_1 & y_2 \\ y_1' & y_2' \end{vmatrix}, \quad W_1 = \begin{vmatrix} 0 & y_2 \\ f(x) & y_2' \end{vmatrix}, \quad W_2 = \begin{vmatrix} y_1 & 0 \\ y_1' & f(x) \end{vmatrix}$$

$$u_1' = \frac{W_1}{W} \implies u_1 = \int \frac{W_1}{W} dx$$
$$u_2' = \frac{W_2}{W} \implies u_2 = \int \frac{W_2}{W} dx$$

$$y_p = u_1 y_1 + u_2 y_2 \text{ and } y = y_c + y_p$$

**Example:** Solve each differential equation by variation of parameters.

$$y'' + y = \sec \theta \tan \theta$$

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