- Assume that a solution to the standard linear ODE is known and is denoted as $y_1(x)$.
- We can find $y_2(x)$ by the observation

$$\frac{d}{dx}\left(\frac{y_2}{y_1}\right) = \frac{y_2'}{y_1} - \frac{y_2 y_1'}{y_1^2} = \frac{y_2' y_1 - y_2 y_1'}{y_1^2} = \frac{W(x)}{y_1(x)^2}$$

- Now the above equation can be integrated to give

$$y_2 = \int_{x_0}^{x} dx' \, \frac{W(x')}{y_1(x)^2}$$