

REPETITION 02/11

Error in the last example :  $y'' - \frac{2}{t} y' + \frac{2}{t^2} y = 1 + \frac{1}{t^2} \quad t > 0$

•  $y_1(t) = t^2$ ,  $y_2(t) = t$  are fundamental solutions of the homog equation

•  $y_p(t) = v_1(t)y_1(t) + v_2(t)y_2(t)$  where

$$\begin{cases} v_1'(t)y_1(t) + v_2'(t)y_2(t) = 0 \\ v_1'(t)y_1'(t) + v_2'(t)y_2'(t) = 0 \end{cases}$$

$$\Rightarrow \begin{cases} v_1'(t) = \frac{1}{t} + \frac{1}{t^3} & \Rightarrow v_1(t) = \ln(t) - \frac{1}{2t^2} \\ v_2'(t) = -1 - \frac{1}{t^2} & \Rightarrow v_2(t) = -t + \frac{1}{t} \end{cases}$$

→  $y_p(t) = t^2(\ln(t) - 1) + \frac{1}{2}$  is a particular solution