

## REPETITION 27/10

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$$y'' + p y' + q y = 0$$

→  $\lambda^2 + p\lambda + q = 0$  characteristic equation

- Two real roots  $\lambda_1, \lambda_2 \in \mathbb{R}$  :

$$y_h(t) = c_1 e^{\lambda_1 t} + c_2 e^{\lambda_2 t}$$

- Two complex roots  $\lambda = a \pm ib \in \mathbb{C}$

$$y_h(t) = e^{at} (c_1 \cos(bt) + c_2 \sin(bt))$$

- One repeated root  $\lambda \in \mathbb{R}$

$$y_h(t) = (c_1 + t c_2) e^{\lambda t}$$

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$$y'' + p y' + q y = f$$

$$\Rightarrow y(t) = y_p(t) + y_h(t)$$

where  $y_p$  is a particular solution

↳ Method of undetermined coefficients.