

18.1.4c

$$y_{t+2} - y_{t+1} + \frac{1}{4} y_t = 2 \quad y_0 = 4 \quad y_1 = 7$$

$$a_1 = -1 \quad a_2 = \frac{1}{4} \quad 1 + a_1 + a_2 = \frac{1}{4} (\neq 0)$$

Partikulær løsning  $y_p = \frac{2}{\frac{1}{4}} = 8$

Løsning til homogene ligning:

$$D = (-1)^2 - 4 \cdot \frac{1}{4} = 0 \quad \text{Dobbelrod} \quad v = \frac{1}{2}$$

$$D \Rightarrow y_c = A_1 \frac{1}{2}^t + A_2 t \frac{1}{2}^t$$

Fuldstændig løsning:

$$y_t = 8 + A_1 \frac{1}{2}^t + A_2 t \frac{1}{2}^t$$

Finder  $A_1$  og  $A_2$ :

$$y_0 = 4 \Leftrightarrow 8 + A_1 = 4 \Leftrightarrow A_1 = -4$$

$$y_1 = 7 \Leftrightarrow 8 - 4 \frac{1}{2} + A_2 \frac{1}{2} = 7 \Leftrightarrow A_2 \frac{1}{2} + 6 = 7$$

$$\Leftrightarrow A_2 = 2$$

$$y_t = 8 - 4 \frac{1}{2}^t + 2 t \frac{1}{2}^t \quad (\text{Konvergent})$$