

15.39

lördag 24 december 2022

14:32

$$a) r^2 + 4 = 0 \quad r = 0 \pm \sqrt{-4} = \pm 2i$$

$$y = e^x (A \cos 2x + B \sin 2x)$$

$$y(0) = 0 \quad A = 0$$

$$y(0) = (A \cos 0 + B \sin 0)$$

$$\begin{array}{ccc} \downarrow & \downarrow & \downarrow \\ A \cdot 1 & B \cdot 0 & \\ A = 0 & 0 = 0 & \end{array}$$

$$\text{Så: } y = B \sin 2x$$

$$y(\pi/2) = e^{\pi/2} (A \cos \pi + B \sin \pi)$$

$$\begin{array}{ccc} \downarrow & \downarrow & \downarrow \\ A \cdot (-1) & B \cdot 0 & \\ A \cdot (-1) = 0 & B \cdot 0 = 0 & \\ A = 0 & & \end{array}$$

$$b) r^2 + 4 = 0 \quad r = \pm 2i$$

$$y = A \cos 2x + B \sin 2x$$

$$y' = -2A \sin 2x + 2B \cos 2x$$

$$y'(0) = -2A \sin 0 + 2B \cos 0 = 2B = 0 \quad B = 0$$

$$\begin{array}{ccc} \downarrow & \downarrow & \\ 0 & 1 & \end{array}$$

$$y'(\pi/2) = -2A \sin \pi + 2B \cos \pi = -2B = 0 \quad B = 0$$

$$\begin{array}{ccc} \downarrow & \downarrow & \\ 0 & -1 & \end{array}$$

$$\text{Så: } y = A \cos 2x$$