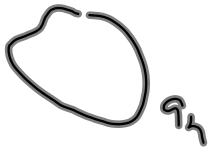
Assignment 15, # 1 $y = c_1\vec{k}_1 e^{\lambda_1 t} + c_2\vec{k}_2 e^{\lambda_2 t}$

Solve $\vec{x}' = \begin{bmatrix} -2 & -2 \\ -\frac{1}{2} & -2 \end{bmatrix}\vec{x}$

$\lambda = \frac{1}{2} \Rightarrow 1 - \frac{1}{3}x + \frac{1}{5\cdot 3}x^2 + \cdots$

$\rightarrow y_1(x) = x^{\frac{1}{2}}\left(1 - \frac{1}{3}x + \frac{1}{5\cdot 3}x^2 + \cdots\right)$

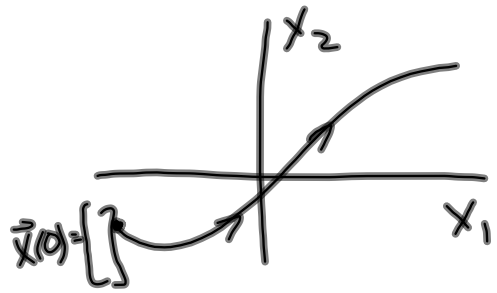
$\lambda = 1 \Rightarrow y_2(x) = x^1\left(\text{- - - -}\right)$

$y(x) = c_1 y_1(x) + c_2 y_2(x)$ $\quad a_{n+2} =$  a_n

$\lambda^2 a_0 + a_1 x(\lambda+1)^2 + \sum_{n=2}$

$\underbrace{\lambda^2 a_0}_{\lambda=0}$ $\quad a_1 x \Rightarrow a_1 = 0$

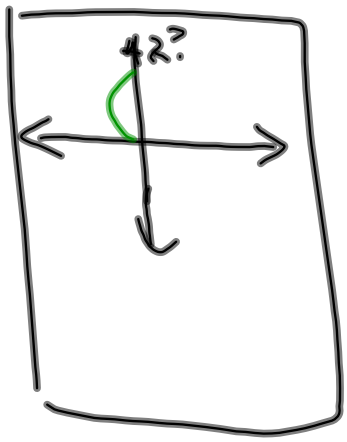
$\vec{x} = \begin{bmatrix} \quad (t) \end{bmatrix}$



$x_1 = x_1(t)$

$x_2 = x_2(t)$

t	$x_1(t)$	$x_2(t)$
0	~	~
1	~	~
2		
3		
4		
⋮		
1		



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$z = a + bi$

$Re(z) = a$

$Im(z) = b$

$$\begin{bmatrix} a+bi \\ c+di \end{bmatrix}$$

Real Part $\begin{bmatrix} a \\ c \end{bmatrix}$

Imaginary Part $\begin{bmatrix} b \\ d \end{bmatrix}$

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