lec 27 :

b) 3.2

S = The set of odd functions in $C[-1,1]$

1) $S \neq \emptyset$ since $0 \in S$

2) f, g odd

$$(f+g)(-x) = f(-x) + g(-x)$$

$$= -f(x) - g(x) = -\left(f(x) + g(x)\right)$$

$$= -(f+g)(x)$$

$f+g \in S$

3) $f \in S$, α scaler

f is odd $\{ f(-x) = -f(x) \}$

$$(\alpha f)(-x) = \alpha f(-x) = -\alpha f(x)$$

$$= -(\alpha f)(x) \in S$$

d) $S = \{ f \in C[-1,1] : f(-1) = 0$ and $f(1) = 0 \}$

1) $S \neq \emptyset$ $\quad 0 \in S$

2) $f, g \in S$

$f(-1) = 0$, $f(1) = 0$, $g(-1) = 0$, $g(1) = 0$

$(f+g) \in S$

3) $\alpha f(x) = 0 \in S$ so

Subspac

$S = \{ f \in C[-1,1] : f(-1) = 0$ or $f(1) = 0 \}$

1) $S \neq \emptyset$

2) $(f+g)(-1) = f(-1) + g(-1)$

$f(x) = x-1 \in S$ $\quad f(1) = 0$

$g(x) = 1+x \in S$

but $f+g = 2x \in S$

Since $(f+g)(-1) = -2 \neq 0$
$(f+g)(1) = 2 \neq 0$

4) 3.4

$X_1 = \begin{pmatrix} 3 \\ -2 \\ 4 \end{pmatrix}$, $X_2 \begin{pmatrix} -3 \\ 2 \\ -1 \end{pmatrix}$

$X_3 = \begin{pmatrix} -6 \\ 4 \\ -8 \end{pmatrix}$

Span (X_1, X_2, X_3) if $\{0\}$ alone

It's l.D

You can Solve it on

$C(A) = S = \left| A = \begin{pmatrix} 3 & -3 & -6 \\ -2 & 2 & 4 \\ 4 & -1 & -6 \end{pmatrix} \right.$

8

3.5 : $I_{u\to v} = S^{-1} = \frac{1}{2}\begin{bmatrix} 1 & -1 \\ -2 & 4 \end{bmatrix}$

$$u_1 = \begin{pmatrix} a \\ b \end{pmatrix} = \frac{1}{2}\begin{pmatrix} 2 \\ 6 \end{pmatrix} + -1\begin{pmatrix} 1 \\ 4 \end{pmatrix}$$

$a = 0$

$b = -1$

$$= \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

$$u_2 = \begin{pmatrix} c \\ d \end{pmatrix} = -\frac{1}{2}\begin{pmatrix} 2 \\ 6 \end{pmatrix} + 2\begin{pmatrix} 1 \\ 4 \end{pmatrix}$$

$$= \begin{pmatrix} 1 \\ 5 \end{pmatrix}$$