10)

$\mathbb{R}_{\leq 2}[x]$	$\mathbb{R}^3$	$(p(0), p'(0), p(-1))$	$v_1 = x^2$ $v_2 = x+1$ $v_3 = x^2-1$	$w_1 = (1,-2,0)$ $w_2 = (0,2,1)$ $w_3 = (1,1,1)$

$p(x) = a + bx + cx^2 \rightsquigarrow (a, b, a-b+c)$

$$A = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 1 & -1 & 1 \end{pmatrix} \qquad M_V = \begin{pmatrix} 0 & 1 & -1 \\ 0 & 1 & 0 \\ 1 & 0 & 1 \end{pmatrix} \qquad M_W = \begin{pmatrix} 1 & 0 & 1 \\ -2 & 2 & 1 \\ 0 & 1 & 1 \end{pmatrix}$$

$$M_V^{-1} = \begin{pmatrix} 1 & -1 & 1 \\ 0 & 1 & 0 \\ -1 & 1 & 0 \end{pmatrix} \qquad M_W^{-1} = \begin{pmatrix} -1 & -1 & 2 \\ -2 & -1 & 3 \\ 2 & 1 & -2 \end{pmatrix}$$

$$\rightsquigarrow \hat{A} = M_W^{-1} A M_V = \begin{pmatrix} 1 & -3 & 2 \\ 1 & -5 & 3 \\ 0 & 3 & -2 \end{pmatrix} M_V = \begin{pmatrix} 2 & -2 & 1 \\ 3 & -3 & 2 \\ -2 & 3 & -2 \end{pmatrix}$$

ex
$\begin{cases} \hat{A} v_2 = (2,3,-2) = (0,0,1) \\ \hat{A} v_2 = (-2,-3,3) = (1,1,0) \end{cases}$