

$$3b) \begin{pmatrix} 2(1)-1 & 2(1)-2 & 2(1)-3 \\ 2(2)-1 & 2(2)-2 & 2(2)-3 \\ 2(3)-1 & 2(3)-2 & 2(3)-3 \end{pmatrix} = \begin{pmatrix} 1 & 0 & -1 \\ 3 & 2 & 1 \\ 5 & 4 & 3 \end{pmatrix}$$

$$\det B = 1(6-4) - 0 + (-1) \cdot (12-10) = 0 //$$

$$4) B = \begin{pmatrix} a & b \\ c & d \end{pmatrix} \begin{matrix} a=2 & b=5 \\ c=-1 & d=4 \end{matrix}$$

$$\det(S) = a \cdot d - b \cdot c = 2 \cdot 4 - 5 \cdot (-1) = 13$$

$$S^{-1} = \frac{1}{ad-bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$$

$$S^{-1} = \frac{1}{13} \begin{pmatrix} 4 & -5 \\ 1 & 2 \end{pmatrix} = \begin{pmatrix} 4/13 & -5/13 \\ 1/13 & 2/13 \end{pmatrix}$$

$$5) V = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \quad \vec{v} = \begin{pmatrix} x \\ y \end{pmatrix}$$

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 5x & 2y \\ 3x & 4y \end{pmatrix} = \begin{pmatrix} 5 \\ 11 \end{pmatrix}$$

$$\begin{cases} x+2y=5 \\ 3x+4y=11 \end{cases} \rightarrow x=5-2y$$

$$3(5-2y)+4y=11 \rightarrow x=5-4$$

$$15-6y+4y=11 \rightarrow x=1 //$$

$$-2y = -4$$

$$y = 2$$