$i=3$ col of N

$$B\vec{w} = (N\vec{e}_i) \rightarrow w = B^{-1}(N\vec{e}_i) = \frac{1}{8}\begin{bmatrix} 1 & -3 \\ 2 & 2 \end{bmatrix}\begin{bmatrix} 2 \\ 3 \end{bmatrix} = \frac{1}{8}\begin{bmatrix} -7 \\ 10 \end{bmatrix}$$

$$w = \begin{bmatrix} -7/8 \\ (10/8) \end{bmatrix} \longrightarrow e_1^T w = \frac{-7}{8}, \quad e_2^T w = \frac{10}{8} = \frac{5}{4}$$

only use $e^T w > 0$, therefore use $e_2^T w = \frac{5}{4}$

$$\frac{e_2^T \times_B^{\downarrow}}{e_2^T w} = \frac{(3/2)}{(5/4)} = \frac{12}{10} = \frac{6}{5} \longrightarrow \frac{e_2^T \times_B^{\downarrow}}{e_2^T w} \text{ is positive, } \boxed{j=2}$$

using $\boxed{i=3}$ and $\boxed{j=2}$ From the steps outlined

Swap 2nd column of $\boxed{B}$ with 3rd column of $\boxed{N}$.

Swap 2nd row of $\boxed{C_B}$ with 3rd row of $\boxed{C_N}$.