$$\begin{vmatrix} -1 & 3 & 6 & 0 \\ 3 & 3 & 5 & 0 \\ 7 & 6 & 8 & 6 \\ 5 & 3 & 5 & 3 \end{vmatrix} \xrightarrow[5R_1+R_4=nR_4]{\substack{3R_1+R_2=nR_2 \\ 7R_1+R_3=nR_3}} \begin{vmatrix} -1 & 3 & 6 & 0 \\ 0 & 12 & 23 & 0 \\ 0 & 27 & 50 & 6 \\ 0 & 18 & 35 & 3 \end{vmatrix} \xrightarrow[=nR_3]{2R_4-R_3} \begin{vmatrix} -1 & 3 & 6 & 0 \\ 0 & 12 & 23 & 0 \\ 0 & 9 & 20 & 0 \\ 0 & 18 & 35 & 3 \end{vmatrix}$$

$$= (3) \begin{vmatrix} -1 & 3 & 6 \\ 0 & 12 & 23 \\ 0 & 9 & 20 \end{vmatrix} = (-3)(-1)\left[(12)(20)-(9)(23)\right] =$$

$$= +3\,(240-207) = +3\,(33) = \boxed{99}$$

$\boxed{3.2.21}$

$$\begin{vmatrix} 5 & 0 & -1 \\ 1 & -3 & -2 \\ 0 & -5 & -3 \end{vmatrix} = \begin{matrix} 5(-1)+(-1)(-5) \\ -5+5=0 \end{matrix}$$

$\Rightarrow$ $\boxed{\text{NOT invertible}}$

$\boxed{3.2.23}$

$$\begin{vmatrix} 1 & -1 & -3 & 0 \\ 0 & 1 & 5 & 4 \\ 3 & -1 & -2 & 4 \\ -1 & 2 & 8 & 5 \end{vmatrix} \xrightarrow[R_1+R_4=nR_4]{3R_1-R_3=nR_3} \begin{vmatrix} 1 & -1 & -3 & 0 \\ 0 & 1 & 5 & 4 \\ 0 & -2 & -7 & 4 \\ 0 & 1 & 5 & 5 \end{vmatrix}$$

$$\xrightarrow[R_2-R_4=nR_4]{2R_2+R_3=nR_3} \begin{vmatrix} 1 & -1 & -3 & 0 \\ 0 & 1 & 5 & 4 \\ 0 & 0 & 3 & 12 \\ 0 & 0 & 0 & -1 \end{vmatrix} \Rightarrow \det(A) = (1)(1)(3)(-1)$$

$$= \boxed{-3}$$

$\boxed{3.2.26}$

$$\begin{vmatrix} 3 & 2 & -2 & 0 \\ 5 & -6 & -1 & 0 \\ -6 & 0 & 3 & 0 \\ 3 & 7 & 0 & -2 \end{vmatrix} \xrightarrow[\substack{R_1 - R_4 \\ = nR_4}]{\substack{5R_1 - 3R_2 \\ = nR_2 \\ 2R_1 + R_3 = nR_3}} \begin{vmatrix} 3 & 2 & -2 & 0 \\ 0 & 28 & -7 & 0 \\ 0 & 4 & -1 & 0 \\ 0 & -5 & -2 & 2 \end{vmatrix}$$

$$= 3 \begin{vmatrix} 28 & -7 & 0 \\ 4 & -1 & 0 \\ -5 & -2 & 2 \end{vmatrix} = (3)(2) \begin{vmatrix} 28 & -7 \\ 4 & -1 \end{vmatrix} = 6(-28 + 28) = \boxed{0} \Rightarrow \boxed{\text{linearly dependent}}$$

$\boxed{3.2.29}$

$$\det B = \begin{vmatrix} 1 & 0 & 2 \\ 2 & 2 & 3 \\ 1 & 2 & 2 \end{vmatrix} \xrightarrow[\substack{R_1 - R_3 \\ = nR_3}]{\substack{2R_1 - R_2 \\ = nR_2}} \begin{vmatrix} 1 & 0 & 2 \\ 0 & -2 & 1 \\ 0 & -2 & 0 \end{vmatrix} \xrightarrow{\substack{R_2 - R_3 \\ = nR_3}} \begin{vmatrix} 1 & 0 & 2 \\ 0 & -2 & 1 \\ 0 & 0 & 1 \end{vmatrix}$$

$$= (1)(-2)(1) = -2$$

$$\Rightarrow \det(B^4) = [\det(B)]^4 = (-2)^4 = \boxed{16}$$