

Section 16.6

$$\textcircled{1} \quad a) \quad \begin{vmatrix} 1 & 4 & 9 \\ 2 & -6 & 3 \\ -1 & 1 & 1 \end{vmatrix}$$

$$= 1 \begin{vmatrix} -6 & 3 \\ 1 & 1 \end{vmatrix} - 4 \begin{vmatrix} 2 & 3 \\ -1 & 1 \end{vmatrix} + 9 \begin{vmatrix} 2 & -6 \\ -1 & 1 \end{vmatrix}$$

$$= 1(-9) - 4(5) + 9(-4)$$

$$= -65$$

A is invertible because $|A| \neq 0$.

$$b) \quad \begin{vmatrix} 1 & -2 & 3 \\ 4 & -5 & 6 \\ 2 & -4 & 6 \end{vmatrix}$$

$$= 1 \begin{vmatrix} -5 & 6 \\ -4 & 6 \end{vmatrix} + 2 \begin{vmatrix} 4 & 6 \\ 2 & 6 \end{vmatrix} + 3 \begin{vmatrix} 4 & -5 \\ 2 & -4 \end{vmatrix}$$

$$= 1(-6) + 2(12) + 3(-6)$$

$$= 0$$

A is not invertible because $|A| = 0$.

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$$c) \begin{vmatrix} -4 & 1 & 6 \\ -3 & 1 & 4 \\ -1 & 0 & 2 \end{vmatrix}$$

$$= -4 \begin{vmatrix} 1 & 4 \\ 0 & 2 \end{vmatrix} - 1 \begin{vmatrix} -3 & 4 \\ -1 & 2 \end{vmatrix} + 6 \begin{vmatrix} -3 & 1 \\ -1 & 0 \end{vmatrix}$$

$$= -4(2) - 1(-2) + 6(1)$$

$$= 0$$

A is not invertible because $|A| = 0$.

$$d) \begin{vmatrix} 1 & 7 & -2 \\ 2 & 3 & -2 \\ -2 & 5 & -2 \end{vmatrix}$$

$$= 1 \begin{vmatrix} 3 & -2 \\ 5 & -2 \end{vmatrix} - 7 \begin{vmatrix} 2 & -2 \\ -2 & -2 \end{vmatrix} - 2 \begin{vmatrix} 2 & 3 \\ -2 & 5 \end{vmatrix}$$

$$= 1(4) - 7(-8) - 2(16)$$

$$= 28$$

A is invertible because $|A| \neq 0$.