12. A square matrix whose determinant is equal to zero is called a
    (1) transposed matrix.
    (2) singular matrix.
    (3) nonsingular matrix.
    (4) null matrix.

13. What is the result if the matrix $\begin{bmatrix} 2 & 3 \\ 2 & 1 \end{bmatrix}$ is multiplied by the factor 5?

    (1) $\begin{bmatrix} 1 & 3 \\ 10 & 5 \end{bmatrix}$ (2) $\begin{bmatrix} 10 & 3 \\ 10 & 1 \end{bmatrix}$ (3) $\begin{bmatrix} 10 & 15 \\ 10 & 5 \end{bmatrix}$ (4) $\begin{bmatrix} 5 & 5 \\ 5 & 5 \end{bmatrix}$

14. Addition and subtraction of matrices is defined only for those that
    (1) are square.
    (2) have the same number of rows and the same number of columns.
    (3) have determinants equal to zero.
    (4) are rectangular.

15. What is the difference $[A] - [B]$ of the following two matrices?

$$[A] = \begin{bmatrix} 1 & 0 \\ 1 & 2 \end{bmatrix} \qquad [B] = \begin{bmatrix} 0 & 1 \\ 0 & 1 \end{bmatrix}$$

    (1) $\begin{bmatrix} -1 & 1 \\ -1 & -1 \end{bmatrix}$ (2) $\begin{bmatrix} 1 & 1 \\ 1 & 3 \end{bmatrix}$ (3) $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$ (4) $\begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$

16. For the product $[A] \cdot [B]$ to be defined,
    (1) the number of rows in $[A]$ must be equal to the number of rows in $[B]$.
    (2) the two matrices, $[A]$ and $[B]$, must be square matrices.
    (3) the number of columns in $[A]$ must be equal to the number of rows in $[B]$.
    (4) the number of columns in $[A]$ must be equal to the number of columns in $[B]$.

17. The product matrix $[C] = [A][B]$ will have
    (1) the same number of rows as $[A]$ and the same number of columns as $[B]$.
    (2) the same number of columns as $[A]$ and the same number of rows as $[B]$.
    (3) the same number of rows and columns as $[A]$.
    (4) the same number of rows and columns as $[B]$.