18. What is the product $[A][B]$ of the two matrices $[A]$ and $[B]$?

$$[A] = \begin{bmatrix} 1 & 1 & 1 \\ 2 & -1 & 0 \\ -1 & 0 & 2 \end{bmatrix} \qquad [B] = \begin{bmatrix} 1 & 2 & 3 & -1 \\ 3 & -1 & 1 & 0 \\ 0 & 0 & -2 & 1 \end{bmatrix}$$

(1) $\begin{bmatrix} 4 & -1 & -1 \\ 1 & 5 & -2 \\ 2 & 5 & -7 \\ 0 & -2 & 3 \end{bmatrix}$ (3) $\begin{bmatrix} -1 & 5 & 5 & -2 \\ -1 & -2 & -7 & 3 \\ 4 & 1 & 2 & 0 \end{bmatrix}$

(2) $\begin{bmatrix} 4 & -1 & -1 \\ 1 & 5 & -2 \\ 2 & 5 & -7 \end{bmatrix}$ (4) $\begin{bmatrix} 4 & 1 & 2 & 0 \\ -1 & 5 & 5 & -2 \\ -1 & -2 & -7 & 3 \end{bmatrix}$

19. For two matrices $[A]$ and $[B]$, the product $[A][B]$ and the product $[B][A]$ are
(1) the same if the number of rows in $[A]$ is equal to the number of columns in $[B]$.
(2) not the same.
(3) The same if $[A]$ and $[B]$ are square matrices.
(4) the same if the number of columns in $[A]$ is equal to the number of rows in $[B]$.

20. The matrix $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ is a
(1) unit matrix.
(2) null matrix.
(3) diagonal matrix.
(4) scalar matrix.

21. The product $[0][A]$ of the null matrix $[0]$ and the matrix $[A]$ is a
(1) unit matrix.
(2) null matrix.
(3) scalar matrix.
(4) diagonal matrix.

22. For the product $[A][B]$ to be a null matrix
(1) both $[A]$ and $[B]$ must be null matrices.
(2) $[A]$ must be a null matrix.
(3) $[B]$ must be a null matrix.
(4) either $[A]$ or $[B]$ can be a null matrix.