

Lecture 5 - Practice Questions

1. Consider the matrix $A = \begin{pmatrix} 1 & 1 \\ 1 & 2 \end{pmatrix}$. Which of the following statements about A is false?
 - A. It is symmetric
 - B. It is invertible
 - C. It is upper triangular
 - D. It is squared
2. Which of the following statements about the matrix $\begin{pmatrix} 1 & 3 \\ 2 & 0 \\ 2 & 0 \end{pmatrix}$ is true?
 - A. It is symmetric
 - B. It is triangular
 - C. It is squared
 - D. None of the others
3. For which value k is the rank of the matrix $\begin{pmatrix} 1 & k \\ 2 & 1 \end{pmatrix}$ equal to one ?
 - A. $k = 0$
 - B. $k = 1/2$
 - C. $k = 1$
 - D. None of the others
4. Which of the following matrices has rank 1?
 - A. $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
 - B. $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$
 - C. $\begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix}$
 - D. $\begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$
5. The trace of a square matrix A is the sum of its diagonal elements, denoted by $tr(A)$. Given the matrix $A = \begin{pmatrix} a & 3 \\ b & 1 \end{pmatrix}$, for which numbers a and b , $tr(A) = 0$ and $det(A) = -10$?
 - A. $a = -1, b = -3$
 - B. $a = -1, b = 3$
 - C. $a = 1, b = -3$
 - D. $a = 1, b = 3$

6. What's the determinant of the matrix resulting from the product $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \cdot \begin{pmatrix} 2 & 1 \\ 1 & 1 \end{pmatrix}$?
- A. 0
 - B. 1
 - C. 2
 - D. None of the others
7. For which value k the determinant of $\begin{pmatrix} 0 & k \\ k & 0 \end{pmatrix}$ is equal to 0 ?
- A. $k = 0$
 - B. $k = 1$
 - C. $k = -1$
 - D. None of the others
8. What's the determinant of the matrix $\begin{pmatrix} 0 & 2 & 3 & 8 \\ 0 & 1 & 1 & 3 \\ 0 & 5 & 7 & 2 \\ 0 & 4 & 2 & 2 \end{pmatrix}$?
- A. -5
 - B. 0
 - C. 2
 - D. None of the others
9. For which value k is the matrix $\begin{pmatrix} 2 & 2 & 3 \\ 0 & k & 1 \\ 0 & 0 & 3 \end{pmatrix}$ not invertible?
- A. $k = 0$
 - B. $k = 1$
 - C. Any $k \in \mathbb{R}$
 - D. None of the others
10. A 2×2 matrix is invertible if...
- A. It has rank 2
 - B. It has a column of all zeros
 - C. Its determinant is zero
 - D. None of the others

Question	Correct Answer
1	C
2	D
3	B
4	D
5	B
6	B
7	A
8	B
9	A
10	A