1. If $A=\left[\begin{matrix}p&q\\r&s\end{matrix}\right] then $ the determinant of

(A2 − (p + s)A + (ps − qr)I) where I is the identity matrix

1. 0
2. ps-qr
3. p2q+rs
4. q2p-rs
5. NOTA
6. The real 3 × 3 matrix A is such that A2 = A. Which of the following statements is not always true
7. (I − A) 2 = I – A
8. (I − A) 3 in the form I + kA, where k is a number to be determined
9. For all real constants λ and all positive integers n, (I + λA) n = I + ((λ + 1)n – 1)A
10. Det(A)=0
11. NOTA
12. Say you have k linear algebraic equations in n variables; in matrix form we write AX = Y . Which of the following statements is always true
13. If n = k there is always at most one solution
14. If n > k you can always solve AX = Y
15. If n < k then for some Y there is no solution of AX = Y
16. If n < k the only solution of AX = 0 is X = 0.
17. NOTA
18. Let A be a matrix, not necessarily square. Say V and W are particular solutions of the equations AV = Y1 and AW = Y2 , respectively, while Z not zero is a solution of the homogeneous equation AZ = 0. Answer the following in terms of V, W, and Z.

Find some solution of AX = 3Y1 − 5Y2 .

1. Z+2V-5W
2. V-W
3. 2Z+3V-5W
4. 3W-5V
5. NOTA



Which of the following exist

1. ABC
2. BAC
3. ACB
4. CBA
5. NOTA



For what value of a will a row interchange be required during Gaussian elimination?

1. 0
2. 1
3. 2
4. 3
5. 4
6. If A is an n × n matrix and it satisfies the equation A3 − 4A2 + 3A − 5In = 0, then A is nonsingular find the inverse of A
7. A2-4A
8. 1/6 (A2-4A)
9. -1/6 (A2-4A)
10. 1/6 (A2+4A)
11. -1/6 (A2+4A)



The determinant of M can be expressed as the constant 5 times the determinant of the single 3 × 3 matrix $\left[\begin{matrix}3&1&5\\3&a&b\\3&c&d\end{matrix}\right]$, then a+b+c+d=

1. 28
2. 30
3. 32
4. 34
5. NOTA
6. The equations

3x + 2y + z = a − 1,

 −2x + (a − 2)y − az = 2a,

 6x + ay + (a − 2)z = 3a − 6 have a solution, not necessarily unique, unless a = .

1. 1/3
2. 2/3
3. 1
4. 4/3
5. NOTA
6. Which of the following statements is not always true
7. For any n × n matrices A and B, AB = BA if and only if (A − kI)(B − kI) = (B − kI)(A − kI) for all values of the real number k.
8. for any n × n matrices A and B, (AB) T = BTAT, where AT is the transpose of A
9. If A and B are n × n symmetric matrices, then AB is symmetric if and only if AB = BA



1. NOTA