Matrix Solvers - Unit 1 - How to access the portal

Assignment 0

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

1) Two coplanar vectors are denoted by $ai + bj$ and $ci + dj$. Then $\det \begin{bmatrix} a & b \\ c & d \end{bmatrix} = \quad 1$ point

- a) Area of the triangle made by the vectors
- b) area of parallelogram made by the vectors
- c) both a and b
- d) none of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
- b) area of parallelogram made by the vectors

2) $A$ and $B$ are two square matrices of same dimension then which one of the following holds true? $\quad 1$ point

- a) $A - B = B - A$
- b) $AB = BA$
- c) $(AB)^T = A^TB^T$
- d) $(AB)^{-1} = B^{-1}A^{-1}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
- c) $(AB)^T = A^TB^T$
- d) $(AB)^{-1} = B^{-1}A^{-1}$

3) For a matrix $A_{m\times n}$ which of the following holds true? $\quad 1$ point

- a) Row rank of $A = \text{column rank of } A$
- b) Row rank of $A \neq \text{column rank of } A$
- c) $\text{Rank } A \leq \text{Max}(m, n)$
- d) $\text{Rank } A \geq \text{Min}(m, n)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
- a) Row rank of $A = \text{column rank of } A$

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For the following matrix find the determinant when $\theta = 45^\circ$.

\[
\begin{bmatrix}
1 & \sin^2\theta \\
1 & \cos^2\theta \\
1 & 2
\end{bmatrix}
\]

- a) 1
- b) 2
- c) 0.5
- d) 0

No, the answer is incorrect.
Score: 0
Accepted Answers:
- d) 0

Consider the system of equations given by the two straight lines $L_1$ and $L_2$. Find which option is true.

- a) $a$ – no solution, $b$ – unique solution, $c$ – infinitely many solution
- b) $b$ – no solution, $a$ – unique solution, $c$ – infinitely many solution
- c) $a$ – no solution, $c$ – unique solution, $b$ – infinitely many solution
- d) $c$ – no solution, $b$ – unique solution, $a$ – infinitely many solution

No, the answer is incorrect.
Score: 0
Accepted Answers:
- a) $a$ – no solution, $b$ – unique solution, $c$ – infinitely many solution
a) \( \hat{A} \) is symmetric matrix

b) \( \hat{A} \) has at least one zero eigenvalue

c) \( x \) is a complex number vector

d) \( \hat{A} \) is positive definite

No, the answer is incorrect.
Score: 0

Accepted Answers:

b) \( \hat{A} \) has at least one zero eigenvalue

9) An iterative method is used for solution of \( A x = b \), \( x^{(k)} \) is the updated value of solution vector at \( k \) th iteration. Then the residual \( b - A x^{(k)} \) must

a) be zero at the first iteration

b) converge to zero for positive initial guess \( x^0 \)

c) converge to zero for higher values of \( k \) for any initial guess \( x^0 \)

d) none of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:

c) converge to zero for higher values of \( k \) for any initial guess \( x^0 \)

10) If \( A x = b \), where \( A = \begin{bmatrix} \sin\theta & \cos\theta \\ -\cos\theta & \sin\theta \end{bmatrix} \) and \( b = \begin{bmatrix} 1 \\ 0 \end{bmatrix} \) then \( x \) is

a) \( x = [1 \ 0]^T \)

b) \( x = [\sin\theta \ \cos\theta]^T \)

c) \( x = [0 \ 1]^T \)

d) \( x = [\cos\theta \ \sin\theta]^T \)

No, the answer is incorrect.
Score: 0

Accepted Answers:

b) \( x = [\sin\theta \ \cos\theta]^T \)