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Unit 2 - Week 1 : Unit 1

Week 1 : Assignment 1

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

Due on 2018-08-15, 23:59 IST.

1) Find the correct option for the following matrices *1 point*

$$A=\begin{bmatrix}3&0&0\\0&1&0\\0&0&-3\end{bmatrix},\ B=\begin{bmatrix}1&0&0\\0&1&0\\0&0&1\end{bmatrix},\ C=\begin{bmatrix}0&0&0\\0&0&0\\0&0&0\end{bmatrix},\ D=\begin{bmatrix}1&0&-1\\0&-2&1\\0&0&1\end{bmatrix}$$

- a) A = identity matrix, B = Hessenberg matrix, C = null matrix, D = upper triangular matrix
- b) A = identity matrix, B = diagonal matrix, C = symmetric matrix, D= lower triangular matrix
- c) A = diagonal matrix, B= symmetric matrix, C = null matrix, D = lower triangular matrix
- d) A= diagonal matrix, B= identity matrix, C = null matrix, D= upper triangular matrix

No, the answer is incorrect.
Score: 0

Accepted Answers:
d) A= diagonal matrix, B= identity matrix, C = null matrix, D= upper triangular matrix

2) Find the correct option for the following matrices *1 point*

$$A=\begin{bmatrix}\sin\theta&\cos\theta\\\cos\theta&\sin\theta\end{bmatrix},\ B=\begin{bmatrix}\sin\theta&-\cos\theta\\\cos\theta&\sin\theta\end{bmatrix}$$

- a) At $\theta=0^\circ$, A= skew-symmetric and B = symmetric
- b) At $\theta=90^\circ$, A = skew-symmetric and B= skew-symmetric
- c) At $\theta=180^\circ$, A= symmetric, B= symmetric

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ce De Find the inverse of matrix $A = \begin{bmatrix} 1 & 0 & 0 \\ -cos\theta & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

a) $A^{-1} = \begin{bmatrix} \sin\theta & \cos 2\theta & \frac{1}{6} \\ 0 & \sin\theta & 1 \\ \sin 2\theta & -\frac{1}{3} & \frac{1}{3} \end{bmatrix}$

b) $A^{-1} = \begin{bmatrix} 1 & 0 & \sin\theta\cos\theta \\ \cos\theta & 1 & 0 \\ 0 & \sin\theta & 1 \end{bmatrix}$

c) $A^{-1} = \begin{bmatrix} 1 & 0 & \frac{1}{\cos\theta} \\ 0 & 1 & 0 \\ 0 & \frac{1}{\cos\theta} & 1 \end{bmatrix}$

d) $A^{-1} = \begin{bmatrix} 1 & 0 & 0 \\ \cos\theta & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$A^{-1} = \begin{bmatrix} 1 & 0 & 0 \\ \cos\theta & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

d)

4) ***1 point***

$A = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}, B = \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$ Find the $(AB)^T$ and $(A^{-1}A+B)^T$

a) $(AB)^T = \begin{bmatrix} 0 & 2 \\ -1 & 1 \end{bmatrix}, (A^{-1}A+B)^T = \begin{bmatrix} 2 & 1 \\ -1 & 2 \end{bmatrix}$

b) $(AB)^T = \begin{bmatrix} 1 & 2 \\ -1 & 0 \end{bmatrix}, (A^{-1}A+B)^T = \begin{bmatrix} 2 & -1 \\ 1 & 2 \end{bmatrix}$

c) $(AB)^T = \begin{bmatrix} 1 & 2 \\ -1 & 0 \end{bmatrix}, (A^{-1}A+B)^T = \begin{bmatrix} 2 & 1 \\ -1 & 2 \end{bmatrix}$

d) None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:

$(AB)^T = \begin{bmatrix} 1 & 2 \\ -1 & 0 \end{bmatrix}, (A^{-1}A+B)^T = \begin{bmatrix} 2 & 1 \\ -1 & 2 \end{bmatrix}$

c)

5) Find the determinant of the matrix $A = \begin{bmatrix} 1 & 2 & 4 \\ 1 & 3 & 9 \\ 1 & 1 & 1 \end{bmatrix}$ ***1 point***

a) -2

b) 2

c) 1

d) None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
b) 2

6) Find the rank of the matrix A= $\begin{bmatrix} sin\theta & cos\theta \\ cos\theta & sin\theta \end{bmatrix}$ at $\theta = 0^\circ$ and $\theta = 45^\circ$ ***1 point***

a) At $\theta = 0^\circ$ rank = 0 and at $\theta = 45^\circ$ rank = 2

b) At $\theta = 0^\circ$ rank = 2 and at $\theta = 45^\circ$ rank = 1

c) At $\theta = 0^\circ$ rank = 1 and at $\theta = 45^\circ$ rank = 2

d) None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
b) At $\theta = 0^\circ$ rank = 2 and at $\theta = 45^\circ$ rank = 1

7) which of the followings is true for matrix multiplication ***1 point***

a) $A_{m\times n}B_{n\times p} = (AB)_{m\times p}$

b) $A_{m\times n}B_{n\times p} = (AB)_{p\times m}$

c) $A_{m\times n}B_{n\times p} = (AB)_{m\times n}$

d) $A_{m\times n}B_{n\times p} = (AB)_{n\times p}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
a) $A_{m\times n}B_{n\times p} = (AB)_{m\times p}$

8) If $P\begin{bmatrix} \sin\theta & \cos\theta \\ -\cos\theta & \sin\theta \end{bmatrix} = \begin{bmatrix} \sin\theta & -\cos\theta \\ \cos\theta & \sin\theta \end{bmatrix}$, then P is a ***0 points***

a) singular matrix, symmetric matrix

b) unit matrix, symmetric matrix

c) singular matrix, skew-symmetric matrix

d) unit matrix, skew-symmetric matrix

No, the answer is incorrect.
Score: 0

Accepted Answers:
b) unit matrix, symmetric matrix

9) Ranks of a null matrix and a unit matrix of dimension $(n \times n)$ are respectively ***1 point***

a) 1 and n

b) n and n

c) n and 1

d) None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
d) None of the above

10) Consider a system Ax=b with n number of unknowns. If [A|b] is the augmented matrix then ***1 point***

a) Ax=b has infinitely many solution if and only if rank [A]=rank [A|b] < n

b) Ax=b is inconsistence if and only if rank [A] > rank [A|b]

c) Ax=b has an unique solution if and only if rank [A] = n > rank=[A|b]

d) None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
a) Ax=b has infinitely many solution if and only if rank [A]=rank [A|b] < n

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