Homework Quiz 7

Due 10 Nov at 6:00 **Points** 180 **Questions** 18
Available 3 Nov at 6:00 - 10 Nov at 6:00 **Time limit** None

This quiz was locked 10 Nov at 6:00.

Attempt history

	Attempt	Time	Score
LATEST	Attempt 1	5,807 minutes	170 out of 180

Score for this quiz: **170** out of 180
Submitted 9 Nov at 1:30
This attempt took 5,807 minutes.

Question 1

10 / 10 pts

If the columns of an $n \times n$ matrix A are linearly independent, then the columns of A span $\mathbb{R}^n$.

Correct!

- (•) True
- ( ) False

Question 2

10 / 10 pts

If the equation $Ax = b$ has at least one solution for each b in $\mathbb{R}^n$, then the solution is unique for each b.

Note: The matrix A is $n \times n$.

Correct!

True

False

Question 3

10 / 10 pts

If the linear transformation $x \to Ax$ maps $\mathbb{R}^n$ to $\mathbb{R}^n$, then A always has n pivot positions.

Note: The matrix A is $n \times n$.

True

Correct!

False

Question 4

10 / 10 pts

If there is a b in $\mathbb{R}^n$ such that the equation $Ax = b$ is inconsistent (i.e. has no solution), then the transformation $x \to Ax$ is not one-to-one.

Note: The matrix A is $n \times n$.

Correct!

True

False

Question 5

10 / 10 pts

The inverse of the matrix: $\begin{bmatrix} 4 & 3 \\ 7 & 5 \end{bmatrix}$

is $\begin{bmatrix} -5 & x \\ 7 & -4 \end{bmatrix}$

What is x?

(Write your answer as an integer, no spaces or decimals.)

Correct!

3

orrect Answers

3

Question 6

10 / 10 pts

The inverse of the matrix: $\begin{bmatrix} 1 & -1 & 2 \\ 2 & -1 & 0 \\ 3 & 0 & -5 \end{bmatrix}$

is: $\begin{bmatrix} 5 & -5 & 2 \\ 10 & -11 & 4 \\ 3 & -3 & x \end{bmatrix}$

What is x?

(Write your answer as an integer. No spaces or decimals.)

Correct!

1

orrect Answers

1

Question 7

10 / 10 pts

A product of invertible $n \times n$ matrices is invertible, and the inverse of the product is the product of their inverses in the same order.

- ○ True
- Correct! ◉ False

Question 8

10 / 10 pts

If a matrix A is invertible, then the inverse of A^{-1} is A itself.

- Correct! ◉ True
- ○ False

Question 9

10 / 10 pts

If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ and $ad = bc$, then A is invertible.

- ○ True
- Correct! ◉ False

Question 10

10 / 10 pts

If a matrix A can be row reduced to the identity matrix, then A must be invertible.

Correct!

True

False

Question 11

0 / 10 pts

If a matrix A is invertible, then the same elementary row operations that reduce A to the identity I also reduce A^{-1} to I.

ou Answered

True

orrect answer

False

See Theorem 7

Question 12

10 / 10 pts

Suppose A, B, and C are invertible $n \times n$ matrices and $C^{-1}(A+X)B^{-1} = I$.

What is X?

$X = C^{-1}X^{-1} - A$

Correct!

$X = CB - A$

$X = B^{-1}C^{-1} - A$

$X = BC - A$

This equation does not have a solution for X.

Question 13

10 / 10 pts

Which of the following are invertible?

(You should first determine if they are invertible by hand--and find the inverse where applicable. You can check your work with MATLAB.)

$\begin{bmatrix} 1 & -2 & -4 \\ 0 & 3 & 6 \end{bmatrix}$

Correct!

$\begin{bmatrix} 1 & 6 & 1 & 4 \\ 0 & 1 & 2 & 3 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 1 \end{bmatrix}$

Correct!

$\begin{bmatrix} -2 & 2 \\ -5 & 4 \end{bmatrix}$

$\begin{bmatrix} 0 & 2 & 8 \\ 0 & 1 & -1 \\ 0 & 3 & 7 \end{bmatrix}$

Question 14

10 / 10 pts

If there is an $n \times n$ matrix D such that $AD = I$, then $DA = I$.

Note: The matrix A is $n \times n$.

Correct!

True

False

Question 15

10 / 10 pts

In order for the linear system, $A\mathbf{x} = \mathbf{b}$ to have a solution, the vector $\mathbf{b}$ must be in the null space.

True

Correct!

False

Question 16

10 / 10 pts

The difference between a set of vectors spanning a subspace in $\mathbb{R}^n$, and a basis for the same subspace in $\mathbb{R}^n$, is

a basis will always contain more vectors than the span.

There is no difference between a span and a basis.

Correct!

a basis will always contain linearly independent vectors.

a basis will contain the zero vector, a span will not.

Question 17

10 / 10 pts

Which one of the following is true for a matrix A having column vectors

$\mathbf{v_1}, \mathbf{v_2}, \mathbf{v_3}, \mathbf{v_4}, \mathbf{v_5}$ and row echelon form $\begin{bmatrix} 1 & 1 & 1 & 1 & 0 \\ 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

Correct!

- v1, v3, and v5 form a basis for the column space of A.
- v1, v3, and v4 form a basis for the column space of A.
- v1, v2, and v4 form a basis for the column space of A.
- Cannot be determined without knowing the entries of A
- v2, v3, and v4 form a basis for the column space of A.

Question 18

10 / 10 pts

Does the vector $\begin{bmatrix} 2 \\ 4 \\ 1 \end{bmatrix}$ belong to the null space of the matrix

$\begin{bmatrix} -2 & 3 & -8 \\ -3 & -3 & 18 \end{bmatrix}$

Correct!

- Yes
- No

Quiz score: **170** out of 180