

In Class Assessment 2 overview

- ▶ Logistics: Thursday in class; covers Chapters 2 (2.1, 2.2, 2.3, 2.5, 2.8, 2.9) and 3 (3.1, 3.2).
- ▶ 100 points, 50 minutes → 2 points per minute “average velocity”
- ▶ Bring your own paper
- ▶ Unlimited use of MATLAB; calculator OK too
- ▶ Exact list of tasks and competencies:
<http://mat233.wikispaces.com/Competencies>
- ▶ Will get revision opportunity later; try not to need it

Which of the following are true for all square matrices A and B (having the same size)?

(A) $AB = BA$

(B) $\det(AB) = \det(BA)$

(C) $(AB)^{-1} = A^{-1}B^{-1}$ (assuming A, B both invertible)

(D) All of the above

(E) (B) and (C) only

(F) None of the above

Suppose A is invertible and 4×4 . Then

- (A) The columns of A are linearly independent.
- (B) The system $A\mathbf{x} = \mathbf{b}$ is always consistent.
- (C) The determinant of A equals 0.
- (D) The null space of A is 0-dimensional.
- (E) All of the above
- (F) (A), (B), and (D) but not (C)
- (G) (A) and (B) only
- (H) None of the above

If H is a subspace of \mathbb{R}^n , then

- (A) The zero vector must belong to H
- (B) Any linear combination of vectors that are in H must also belong to H
- (C) A basis for H contains n vectors
- (D) All of the above
- (E) Both (A) and (B) but not (C)

$$H = \left\{ \begin{bmatrix} x \\ y \end{bmatrix} : x^2 + y^2 \leq 1 \right\}$$

H is a subspace of \mathbb{R}^2 .

- (A) True
- (B) False

$$A = \begin{bmatrix} 1 & 2 \\ -2 & -4 \end{bmatrix}$$

The vector $\mathbf{v} = \begin{bmatrix} -4 \\ 2 \end{bmatrix}$ is in the null space of A .

- (A) True
- (B) False

$$A = \begin{bmatrix} 1 & 2 \\ -2 & -4 \end{bmatrix}$$

The vector $\mathbf{v} = \begin{bmatrix} 3 \\ 7 \end{bmatrix}$ is in the column space of A .

- (A) True
- (B) False

$$A = \begin{bmatrix} 5 & 5 & -4 & 3 & -5 \\ 45 & 45 & -37 & 32 & -41 \\ -40 & -40 & 45 & -62 & 13 \end{bmatrix} \xrightarrow{\text{RREF}} \begin{bmatrix} 1 & 1 & 0 & 0 & -\frac{142}{135} \\ 0 & 0 & 1 & 0 & \frac{17}{27} \\ 0 & 0 & 0 & 1 & \frac{25}{27} \end{bmatrix}$$

The dimension of the null space of A equals

- (A) 0
- (B) 1
- (C) 2
- (D) 3
- (E) 4
- (F) 5
- (G) Infinite

$$A = \begin{bmatrix} 5 & 5 & -4 & 3 & -5 \\ 45 & 45 & -37 & 32 & -41 \\ -40 & -40 & 45 & -62 & 13 \end{bmatrix} \xrightarrow{\text{RREF}} \begin{bmatrix} 1 & 1 & 0 & 0 & -\frac{142}{135} \\ 0 & 0 & 1 & 0 & \frac{17}{27} \\ 0 & 0 & 0 & 1 & \frac{25}{27} \end{bmatrix}$$

rank $A =$

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5
- (F) None of the above

Suppose A is a square matrix with determinant equal to 6. Suppose B is obtained from A by rescaling the first row of A by a factor of 2 and then swapping two of its rows. Then $\det B$ equals

- (A) -12
- (B) -6
- (C) -3
- (D) 3
- (E) 6
- (F) 12
- (G) Not enough information