

Precalculus · Matrices and Matrix Operations · Test

Common Core N-VM.C.6, N-VM.C.7, N-VM.C.8, N-VM.C.9, N-VM.C.10 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

This precalculus matrices test checks matrices and matrix operations in 45 minutes, with 8 questions for a total of 20 points.

This test has 8 questions worth 20 points and takes about 45 minutes. Show every row-by-column calculation, and write matrices with brackets. A calculator is allowed for arithmetic. The questions cover data matrices, operations, products, determinants and inverses.

Test information

- **Grade:** Precalculus
- **Chapter:** Matrices and Matrix Operations
- **Common Core:** N-VM.C.6, N-VM.C.7, N-VM.C.8, N-VM.C.9, N-VM.C.10
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 2 pts; Question 2: 2 pts; Question 3: 2 pts; Question 4: 3 pts; Question 5: 2 pts; Question 6: 2 pts; Question 7: 3 pts; Question 8: 4 pts)

Precalculus Matrices Test: questions 1-5

Question 1: Write a data matrix (2 points)

The table shows game statistics.

Player	Points	Rebounds	Assists
Aisha	18	7	4
Ethan	12	9	6

- Write a matrix with one row per player and state its dimensions. (1 point)
- State the entry in row 2, column 3 and what it means. (1 point)

Question 2: Add and scale matrices (2 points)

Use the matrices below.

$$A = \begin{bmatrix} 4 & -2 \\ 1 & 3 \end{bmatrix} \quad B = \begin{bmatrix} 0 & 5 \\ -3 & 2 \end{bmatrix}$$

Matrices A and B.

- Find $A+B$. (1 point)
- Find $3A-2B$. (1 point)

Question 3: Solve for unknowns (2 points)

Find a , b and c .

$$\begin{bmatrix} 2a & 3 \\ b & -1 \end{bmatrix} + \begin{bmatrix} 4 & c \\ 5 & 2 \end{bmatrix} = \begin{bmatrix} 10 & 8 \\ 9 & 1 \end{bmatrix}$$

A matrix equation with three unknowns.

Question 4: Multiply matrices (3 points)

Use the matrices below.

$$R = \begin{bmatrix} 2 & 1 & 0 \\ -1 & 3 & 4 \end{bmatrix} \quad S = \begin{bmatrix} 1 & 2 \\ 0 & -1 \\ 3 & 5 \end{bmatrix}$$

Matrices R and S.

- State the dimensions of RS . (1 point)
- Find RS . (2 points)

Question 5: Order of multiplication (2 points)

Find AB and BA for the matrices below, and state whether they are equal.

$$A = \begin{bmatrix} 2 & 1 \\ 0 & 3 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 4 \\ 2 & 0 \end{bmatrix}$$

Matrices A and B.

Precalculus Matrices Test: questions 6-8

Question 6: Determinants and invertibility (2 points)

For each matrix, find the determinant and state whether the matrix has an inverse.

$$\begin{array}{cc} \begin{bmatrix} 7 & 3 \\ 4 & 2 \end{bmatrix} & \begin{bmatrix} 6 & -9 \\ -2 & 3 \end{bmatrix} \\ \text{(a)} & \text{(b)} \end{array}$$

Two 2×2 matrices.

Question 7: Find and verify an inverse (3 points)

Use matrix M .

$$M = \begin{bmatrix} 5 & 3 \\ 3 & 2 \end{bmatrix}$$

Matrix M .

- Find $\det M$. (1 point)
- Find M^{-1} . (1 point)
- Verify by computing MM^{-1} . (1 point)

Question 8: Smoothie stand revenue (4 points)

Sofia sells small, medium and large smoothies. Matrix S gives the number sold on Saturday and Sunday. Matrix P gives the prices in dollars.

$$S = \begin{array}{c} \text{Sat} \\ \text{Sun} \end{array} \begin{array}{c} \text{Small} \\ \text{Medium} \\ \text{Large} \end{array} \begin{bmatrix} 30 & 45 & 20 \\ 25 & 50 & 35 \end{bmatrix} P = \begin{bmatrix} 3 \\ 4 \\ 5 \end{bmatrix}$$

Dollars each

Sales matrix S and price matrix P .

- State the dimensions of SP and what each entry represents. (1 point)
- Find SP . (2 points)
- Find the total revenue for both days. (1 point)

How to use this precalculus matrices test

Take this precalculus matrices test without notes, then grade it with the test answer key out of 20 points.

