

Precalculus · Matrices and Matrix Operations · Quiz

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 quiz asks 10 multiple-choice questions on matrices and matrix operations, and each answer comes with a short explanation.

Ten multiple-choice questions on matrix dimensions, addition, scalar multiplication, products, determinants and inverses. Choose the best answer, then read the explanation to see the typical mistake. Each question has exactly one correct option.

PrecalculusCommon Core: N-VM.C.6 · N-VM.C.7 · N-VM.C.8 · N-VM.C.9 · N-VM.C.10

Questions

Question 1

What are the dimensions of this matrix?

$$\begin{bmatrix} 4 & -1 \\ 0 & 7 \\ 2 & 5 \end{bmatrix}$$

A matrix with three rows and two columns.

- A. 2×3
- B. 3×2
- C. 6×1
- D. 3×3

Question 2

What is the entry in row 2, column 3?

$$\begin{bmatrix} 5 & -2 & 8 \\ 1 & 0 & -4 \end{bmatrix}$$

A 2×3 matrix.

- A. 8
- B. 1
- C. -2
- D. -4

Question 3

Which pair of matrices can be added?

- A. a 2×3 and a 3×2 matrix
- B. a 2×2 and a 3×3 matrix
- C. a 1×3 and a 3×1 matrix
- D. a 2×3 and a 2×3 matrix

Question 4

What is the sum of all four entries of $2A$?

$$A = \begin{bmatrix} 3 & -1 \\ 0 & 4 \end{bmatrix}$$

Matrix A.

- A. 6
- B. 12
- C. 9
- D. 24

Question 5

What is the entry in row 1, column 1 of AB ?

$$A = \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix} \quad B = \begin{bmatrix} 5 & 1 \\ 2 & 6 \end{bmatrix}$$

Matrices A and B.

- A. 10
- B. 12
- C. 16
- D. 13

Question 6

A 2×3 matrix is multiplied by a 3×4 matrix. What are the dimensions of the product?

- A. 3×3
- B. 2×3
- C. 2×4
- D. 3×4

Question 7

Which statement is true for every 2×2 matrix A and the identity matrix I ?

- A. $AI = A$
- B. $AB = BA$ for every matrix B
- C. $AO = A$ for the zero matrix O
- D. $A + I = A$

Question 8

What is the determinant of this matrix?

$$\begin{bmatrix} 6 & 4 \\ 3 & 5 \end{bmatrix}$$

A 2×2 matrix.

- A. 18
- B. 42
- C. -18
- D. 11

Question 9

For which value of k does the matrix with top row $k, 3$ and bottom row $4, 6$ fail to have an inverse?

- A. $k = -2$
- B. $k = 2$
- C. $k = 12$
- D. $k = \frac{1}{2}$

Question 10

What is the entry in row 1, column 2 of the inverse of this matrix?

$$\begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$$

A 2×2 matrix with determinant 1.

- A. 1
- B. 2
- C. -1
- D. -2

Answer key

1. **B** – Dimensions are rows by columns: 3 rows and 2 columns. Reversing the order gives 2×3 .
2. **D** – Go down to row 2, then across to column 3. The entry 8 is in row 1, column 3.
3. **D** – Addition needs identical dimensions. Equal numbers of entries is not enough: 2×3 and 3×2 differ.
4. **B** – The entries of $2A$ are 6, -2 , 0, 8, which add to 12. The sum 6 comes from forgetting to scale; 9 scales only one entry.
5. **C** – Use row 1 of A and column 1 of B : $2 \cdot 5 + 3 \cdot 2 = 16$. Multiplying matching positions only gives 10.
6. **C** – The outer numbers give the product dimensions: 2×4 . The inner numbers (3 and 3) must match but do not appear.
7. **A** – The identity leaves a matrix unchanged under multiplication. The zero matrix gives $AO = O$, and matrix multiplication is not commutative.
8. **A** – $ad - bc = 6 \cdot 5 - 4 \cdot 3 = 30 - 12 = 18$. Adding the products gives 42, and reversing the subtraction gives -18 .
9. **B** – The determinant is $6k - 12$. It equals 0 when $k = 2$; a singular matrix has no inverse.
10. **C** – The determinant is $2 - 1 = 1$, so the inverse has top row $1, -1$ and bottom row $-1, 2$. The top-right entry is $-b = -1$; keeping the sign gives 1.

How does this quiz work?

Read each question, choose one answer among A, B, C and D, then check it: a short explanation appears after every answer. Your score out of 10 is shown at the end, and you can restart the quiz as often as you like.

What should you review before the quiz?

Reread the key facts of the lesson and the worked example. If a question is hard, go back to the matching part of the lesson, then try the quiz again. Write your work on scrap paper: most mistakes come from skipping a step, not from the idea itself.

Remember:

- An $m \times n$ matrix has m rows and n columns; entry a_{ij} sits in row i , column j .
- Add or subtract matrices only when dimensions match; scalar multiplication scales every entry.
- AB exists when columns of A equal rows of B , and in general $AB \neq BA$.
- $A + O = A$ and $AI = IA = A$ for the zero matrix O and identity matrix I .
- For a 2×2 matrix, $\det A = ad - bc$, and A^{-1} exists exactly when $\det A \neq 0$.

How to use this precalculus matrices quiz

Retake this precalculus matrices quiz until every answer is right, then move on to the worksheet and the test.

