

Write your questions
and thoughts here!

Matrix Basics

$$\begin{bmatrix} a_{1,1} & a_{1,2} & a_{1,3} \\ a_{2,1} & a_{2,2} & a_{2,3} \end{bmatrix}$$

Matrix Dimensions: Rows x columnsMatrix Elements: Each individual component, referred to by location of row and column.

Matrix Addition/Subtraction

$$\begin{bmatrix} -3 & 4 \\ 5 & -2 \end{bmatrix} + \begin{bmatrix} -4 & -1 \\ -5 & 5 \end{bmatrix}$$

Matrix Scalar Multiplication

$$3 \begin{bmatrix} 2 & -4 \\ 3 & 8 \end{bmatrix}$$

Matrix Multiplication

$$A \quad \times \quad B \quad = \quad C$$

(Rows x Columns) x (Rows x Columns) = Rows A x Columns B

$$\begin{bmatrix} 1 & 0 \\ -3 & 3 \\ -5 & 8 \end{bmatrix} \cdot \begin{bmatrix} 0 & 4 & -1 \\ -4 & 6 & -8 \end{bmatrix}$$

Does $B \times A = C$?

Side Note

Commutative Property

$$A + B = B + A$$

Associative Property

$$(A + B) + C = A + (B + C)$$

Additive Identity

$$A + 0 = A$$

Side Note

Commutative Property: Um...no.

Associative Property

$$(A \times B) \times C = A \times (B \times C)$$

Additive Identity

$$A \times I = A^*$$

A must be an $n \times n$ matrix. I is the identity matrix

Write your questions

TRY THIS:

Easier Way?

$$\begin{bmatrix} 4 & 3 & 1 & 0 \\ 3 & -4 & 5 & 9 \end{bmatrix} \cdot \begin{bmatrix} -2 & 4 & 0 \\ 8 & 4 & 3 \\ -9 & -3 & 2 \\ 0 & -1 & 4 \end{bmatrix}$$

4.10 Matrices

AP Precalculus

4.10 Practice

Directions: Simplify the following matrices to a single matrix.

1) $\begin{bmatrix} 4 & 8 \\ -3 & -2 \\ 1 & 0 \end{bmatrix} - \begin{bmatrix} 10 & 4 \\ 9 & -8 \\ -8 & -6 \end{bmatrix}$

2) $\begin{bmatrix} 4 & -9 & 8 & 1 \\ 10 & -13 & 2 & 9 \\ 6 & 4 & -2 & 5 \end{bmatrix} + 2 \begin{bmatrix} 1 & 0 & 2 & -3 \\ 3 & -3 & 6 & 4 \\ -4 & 2 & 3 & 5 \end{bmatrix}$

3) $-3 \begin{bmatrix} 4 & -3 \\ -2 & 9 \end{bmatrix} + 4 \begin{bmatrix} 0 & 2 \\ -3 & 5 \end{bmatrix}$

4) $[4 \ 3 \ -2] - 5[-4 \ 2 \ 0]$

Directions: Determine if the following matrices can be multiplied. If so, determine the dimensions of the multiplied matrix.

5) $(5 \times 8) \times (8 \times 7)$

6) $(3 \times 7) \times (3 \times 7)$

7) $(9 \times 10) \times (10 \times 1)$

Directions: Multiply the following matrices. No Calculators.

$$8) \begin{bmatrix} 3 & 5 \\ 4 & -9 \\ -4 & 0 \end{bmatrix} \cdot \begin{bmatrix} 4 & 6 & 8 \\ -1 & 0 & 2 \end{bmatrix}$$

$$9) \begin{bmatrix} 4 & 6 & 8 \\ -1 & 0 & 2 \end{bmatrix} \cdot \begin{bmatrix} 3 & 5 \\ 4 & -9 \\ -4 & 0 \end{bmatrix}$$

$$10) [4 \quad -10 \quad 3] \cdot \begin{bmatrix} -4 \\ 6 \\ 9 \end{bmatrix}$$

$$11) \begin{bmatrix} 3 & 5 & -9 & 5 \\ -4 & 0 & 1 & -2 \end{bmatrix} \cdot \begin{bmatrix} 1 & 3 & -6 \\ 0 & 5 & -8 \\ 0 & 1 & 3 \\ 9 & -7 & 5 \end{bmatrix}$$

$$12) [-3 \quad 5] \cdot \begin{bmatrix} 3 & -7 & 5 & -8 \\ 2 & 0 & 5 & -7 \end{bmatrix}$$

$$13) \begin{bmatrix} 54 & -34.5 \\ 58.9 & 93.4 \end{bmatrix} \cdot \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

CALCULATOR ACTIVE: Directions: Multiply with a calculator.

$$14) \begin{bmatrix} 0.4 & 1.3 & 2.5 \\ 1.2 & 0.5 & 0.2 \\ 4.2 & 3.4 & 1.2 \\ 2.1 & 5.4 & 3.3 \end{bmatrix} \cdot \begin{bmatrix} 2 & 2.5 & 3 & 3.5 & 4 \\ 1.5 & 2 & 2.5 & 3 & 3.5 \\ 1 & 1.5 & 2 & 2.5 & 3 \end{bmatrix}$$

4.10 Matrices

15) (1.11A) What is the second term when $(2a - b)^4$ is expanded?

- (A) $-32a^3b$
- (B) $-4a^2b^2$
- (C) $-16ab^3$
- (D) $-ab^4$

16) (1.11B) The function f is given by $f(x) = \frac{6x^2+ax+2}{x+3}$ and has a slant asymptote of $y = 6x + 3$. What is the value of a ?

- (A) -4
- (B) 12
- (C) 15
- (D) 21

17) (1.13)

x	2	4	6	8	10	12
$f(x)$	97	405	977	1861	3105	4757

Which of the following statements are true ?

- (A) The function is quadratic because the second differences are a nonzero constant.
- (B) The function is quadratic because the third differences are a nonzero constant.
- (C) The function is cubic because the second differences are a nonzero constant.
- (D) The function is cubic because the third differences are a nonzero constant.