LESSON MAKER PRO

Matrix Moves

Organize data and calculate with matrices.

HIGH SCHOOL · A2.N.2

A2.N.2 "Extend the understanding of numbers and operations to matrices. Use matrices to organize and represent data. Identify the order (dimension) of a matrix. Use addition, subtraction, and scalar multiplication of matrices to solve problems."

NAME _____ **DATE** _____

ROWS, COLUMNS, AND OPERATIONS

A matrix organizes numbers in rows and columns. Its order is the number of rows by the number of columns. Add or subtract matrices of the same order by matching positions, and multiply a matrix by a scalar by multiplying every entry.

WORKED EXAMPLE

Add [[41, 43], [47, 49]] and [[51, 53], [57, 59]].

1. Both matrices have 2 rows and 2 columns, so match entries in the same positions.
2. First row: 41 + 51 = 92 and 43 + 53 = 96.
3. Second row: 47 + 57 = 104 and 49 + 59 = 108.

Answer: [[92, 96], [104, 108]]

PRACTICE 6 problems

1 What is the order of [[5, 9, 1], [6, 10, 3]]?

ANSWER _____

2 Add [[2, 5], [9, 1]] and [[6, 3], [4, 10]].

ANSWER _____

3 Subtract [[3, 2, 1], [4, 1, 1]] from [[10, 6, 4], [9, 5, 1]].

ANSWER _____

4 Find 3 times [[2, -1], [0, 5]].

ANSWER _____

5 Find 2 times [[1, 3], [5, 2]], then add [[4, 1], [3, 6]].

ANSWER _____

6 Let A = [[4, 6], [3, 1]] and B = [[2, 5], [1, 9]]. Find A - B and state its order.

ANSWER _____

APPLY IT Show your work

1 The table shows items sold at two booths during a Friday concert. On Saturday, each booth sells twice as many of each item as it did on Friday. Make a matrix for the total sold over both days. Use booths as rows, in the order shown, and shirts and pins as columns.

FRIDAY CONCERT SALES

Booth	Shirts	Pins
North	9	6
South	5	3

ANSWER _____

2 The table shows each channel's cumulative followers, in hundreds. Make a matrix of follower gains from Monday to Tuesday and from Tuesday to Wednesday. Use channels as rows, in the order shown, and time periods as columns. Which channel gained more followers across both periods, and by how many followers?

CHANNEL FOLLOWERS, IN HUNDREDS

Channel	Mon	Tue	Wed
Art	12	15	19
Gaming	8	14	18

ANSWER _____

CHALLENGE One step up

Let A = [[5, -2], [1, 4]]. Find B if 3A - B = [[8, -1], [5, 10]]. Explain how you found B.

WORK SPACE AND ANSWER

ANSWER KEY

Matrix Moves

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	What is the order of [[5, 9, 1], [6, 10, 3]]?	**2 by 3**
2	Add [[2, 5], [9, 1]] and [[6, 3], [4, 10]].	**[[8, 8], [13, 11]]**
3	Subtract [[3, 2, 1], [4, 1, 1]] from [[10, 6, 4], [9, 5, 1]].	**[[7, 4, 3], [5, 4, 0]]**
4	Find 3 times [[2, -1], [0, 5]].	**[[6, -3], [0, 15]]**
5	Find 2 times [[1, 3], [5, 2]], then add [[4, 1], [3, 6]].	**[[6, 7], [13, 10]]**
6	Let A = [[4, 6], [3, 1]] and B = [[2, 5], [1, 9]]. Find A - B and state its order.	**A - B = [[2, 1], [2, -8]]; order: 2 by 2**

PART 2 · APPLY IT

1. **[[27, 18], [15, 9]]** Friday's sales form [[9, 6], [5, 3]]. Saturday's sales are twice Friday's, so multiply Friday's matrix by 3 to get the two-day total.
2. **Gains, in hundreds: [[3, 4], [6, 4]]. Gaming gained 300 more followers.** Subtract each day's count from the next day's count. Art gained 7 hundred followers in all, while Gaming gained 10 hundred, a difference of 3 hundred.

CHALLENGE

B = [[7, -5], [-2, 2]]. Since 3A - B is given, subtract the given matrix from 3A to find B.

Accept equivalent matrix notation if entries remain in the correct rows and columns. For the challenge, accept any explanation that correctly isolates B.