LESSON MAKER PRO

Matrix Moves

Add, subtract, and multiply matrices in school and real-world situations.

HIGH SCHOOL · MA.912.NSO.4.3

MA.912.NSO.4.3 "Solve mathematical and real-world problems involving addition, subtraction and multiplication of matrices."

NAME _____ DATE _____

MATCH, COMBINE, MULTIPLY

You can add or subtract matrices only when they have matching dimensions. Combine entries that are in the same position. To multiply matrices, pair each row of the first matrix with each column of the second matrix, multiply matching entries, and add the products.

WORKED EXAMPLE

Find [[41,42],[43,44]] + [[51,52],[53,54]].

1. Add the top-left entries: 41 + 51 = 92.
2. Add the top-right and bottom-left entries: 42 + 52 = 94 and 43 + 53 = 96.
3. Add the bottom-right entries: 44 + 54 = 98.

Answer: [[92,94],[96,98]]

PRACTICE 6 problems

1 Find [[1,-4],[6,2]] + [[-3,5],[-8,7]].

ANSWER _____

2 Find [[-5,4],[7,-2]] - [[3,-6],[-1,8]].

ANSWER _____

3 Find the product [[1,2],[3,4]][[2,-1],[-1,3]].

ANSWER _____

4 Find the product [[2,0,-1],[4,3,1]][[1,2],[-2,1],[2,-1]].

ANSWER _____

5 Find [[-2,5,1],[4,0,-3]] + [[6,-1,2],[-5,7,4]].

ANSWER _____

6 Let A = [[6,-3],[2,5]] and B = [[-4,6],[7,-1]]. Find A - B.

ANSWER _____

APPLY IT Show your work

1 A school store holds a first and second lunch pop-up each week. Rows represent hoodies and caps; columns represent first and second pop-ups. Week 1 sales are [[20,24],[30,28]], and Week 2 sales are [[25,21],[26,22]]. Add the matrices to find two-week totals for each item and corresponding pop-up slot.

WORK SPACE

ANSWER

2 A gaming club plans food for two tournament sessions. Rows of Q represent Session A and Session B, and columns represent smoothies, pretzels, and fruit cups. Q = [[5,4,3],[6,2,5]], and the price column in dollars is p = [[4],[3],[2]]. Find Qp and state what each entry means.

WORK SPACE

ANSWER

CHALLENGE One step up

Let A = [[1,2],[3,0]], B = [[-1,4],[2,1]], and C = [[1,-1],[1,1]]. Find (A + B)C.

WORK SPACE AND ANSWER

ANSWER KEY # Matrix Moves

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find [[1,-4],[6,2]] + [[-3,5],[-8,7]].	**[[-2,1],[-2,9]]**
2	Find [[-5,4],[7,-2]] - [[3,-6],[-1,8]].	**[[-8,10],[8,-10]]**
3	Find the product [[1,2],[3,4]][[2,-1],[-1,3]].	**[[0,5],[2,9]]**
4	Find the product [[2,0,-1],[4,3,1]][[1,2],[-2,1],[2,-1]].	**[[0,5],[0,10]]**
5	Find [[-2,5,1],[4,0,-3]] + [[6,-1,2],[-5,7,4]].	**[[4,4,3],[-1,7,1]]**
6	Let A = [[6,-3],[2,5]] and B = [[-4,6],[7,-1]]. Find A - B.	**[[10,-9],[-5,6]]**

PART 2 · APPLY IT

1. **[[45,45],[56,50]]** Add corresponding entries. Across the two weeks, the first/second pop-up slots sold 45/45 hoodies and 56/50 caps.
2. **[[38],[40]], meaning Session A costs $38 and Session B costs $40.** Multiply each session row by the price column. Each product is the total food cost for that session.

CHALLENGE

[[6,6],[6,-4]]

Accept equivalent matrix formatting if entries are in the correct rows and columns. For multiplication, require that students preserve the order of operations in expressions such as (A + B)C.