LESSON MAKER PRO

Matrix Data Moves

Represent data, combine it, and interpret the result.

HIGH SCHOOL · HSN-VM.C.6

CCSS.Math.Content.HSN-VM.C.6 "(+) Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network."

NAME _____ DATE _____

MATRICES ORGANIZE DATA

A matrix stores related data in rows and columns. Add or subtract matrices of the same size by combining entries in matching positions. To multiply matrices, multiply each row of the first matrix by each column of the second matrix, then add the products.

WORKED EXAMPLE

Find AB for A = [[4, 9], [-2, 6]] and B = [[7, -5], [3, 8]].

1. Top-left entry: 4 x 7 + 9 x 3 = 55.
2. Top-right entry: 4 x -5 + 9 x 8 = 52.
3. Bottom-left entry: -2 x 7 + 6 x 3 = 4.
4. Bottom-right entry: -2 x -5 + 6 x 8 = 58.

Answer: AB = [[55, 52], [4, 58]]

PRACTICE 6 problems

1 Rows represent Asha and Ben. Columns represent podcasts and articles. Asha completed 11 podcasts and 12 articles. Ben completed 13 podcasts and 14 articles. Write the data as a matrix.

ANSWER _____

2 Find P + Q. P = [[11, 13], [16, 12]] and Q = [[14, 10], [15, 11]].

ANSWER _____

3 Find L - R. L = [[26, 21], [24, 27]] and R = [[12, 11], [13, 14]].

ANSWER _____

4 Compute 12C for C = [[11, 13], [14, 15]].

ANSWER _____

5 Find the product [[11, 12]] [[13], [14]].

ANSWER _____

6 Find MN. M = [[11, 12], [13, 14]] and N = [[15, 16], [17, 18]].

ANSWER _____

APPLY IT Show your work

1 A student-run concert shop tracks hoodie and sticker orders. Rows represent online and in-person orders. Columns represent hoodies and stickers. Monday's matrix is M = [[18, 21], [16, 19]], and Tuesday's matrix is T = [[14, 17], [15, 12]]. Find M + T and state what the entry in the second row, second column means.

WORK SPACE

ANSWER _____

2 For an esports watch party, a student council sells 12 standard tickets for $15 each and 14 VIP tickets for $16 each. Use the row matrix [[12, 14]] and the column matrix [[15], [16]] to find the total ticket revenue.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A student media team records the number of short videos, photo posts, and livestreams made by the North and South teams in A = [[10, 11, 12], [13, 14, 15]]. Matrix B = [[16, 17], [18, 19], [20, 21]] gives engagement points per item on StreamSpace and ClipCloud. Compute AB. Then explain what the entry 631 means.

WORK SPACE AND ANSWER

ANSWER KEY

Matrix Data Moves

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Rows represent Asha and Ben. Columns represent podcasts and articles. Asha completed 11 podcasts and 12 articles. Ben completed 13 podcasts and 14 articles. Write the data as a matrix.	**[[11, 12], [13, 14]]**
2	Find P + Q. P = [[11, 13], [16, 12]] and Q = [[14, 10], [15, 11]].	**[[25, 23], [31, 23]]**
3	Find L - R. L = [[26, 21], [24, 27]] and R = [[12, 11], [13, 14]].	**[[14, 10], [11, 13]]**
4	Compute 12C for C = [[11, 13], [14, 15]].	**[[132, 156], [168, 180]]**
5	Find the product [[11, 12]] [[13], [14]].	**[[311]]**
6	Find MN. M = [[11, 12], [13, 14]] and N = [[15, 16], [17, 18]].	**[[369, 392], [433, 460]]**

PART 2 · APPLY IT

1. **M + T = [[32, 38], [31, 31]]. The entry 31 means there were 31 in-person sticker orders across Monday and Tuesday.** Add matching entries in the two daily order matrices. The second row represents in-person orders, and the second column represents stickers.
2. **$404** Multiply the row by the column: 12 x 15 + 14 x 16 = 180 + 224 = 404.

CHALLENGE

AB = [[598, 631], [760, 802]]. The entry 631 is the North team's total engagement points on ClipCloud.

Accept equivalent matrix formatting when entries are in the correct rows and columns. For interpretation items, accept equivalent wording that correctly identifies the row category, column category, and meaning of the entry.