

## Flying Matrices

You've seen that there is a natural way to add matrices. Namely, if the matrices have the same dimensions, you simply add the corresponding entries. (If the matrices have different dimensions, you can't add them.)

Defining multiplication of matrices is harder, and the definition is somewhat arbitrary. The arithmetic in these questions will be the basis for deciding what might make sense when defining how matrices are multiplied.

1. In *Heavy Flying*, you were given these facts about the materials that Lindsay transports.
  - Charley's Chicken Feed packages its product in containers that weigh 40 pounds and are 2 cubic feet in volume.
  - Careful Calculators packages its materials in boxes that weigh 50 pounds and are 3 cubic feet in volume.Organize this information into a matrix. Label the rows and columns to show what the numbers represent.
2. Suppose that on Monday, Lindsay transports 500 containers of chicken feed and 200 boxes of calculators. Put those facts into a matrix.
3. Use the information in your two matrices to find the total weight and the total volume Lindsay transported on Monday. Put those two answers into a matrix.
4. Explain how you used the information in the matrices you created in Questions 1 and 2 to calculate the numbers for Question 3.
5. Suppose that on Tuesday, Lindsay transports 400 containers of chicken feed and 300 boxes of calculators. Combine this information with the data from Question 2 to form a  $2 \times 2$  matrix showing exactly what she carried on Monday and on Tuesday.

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6. Combine the information in your answers to Questions 1 and 5 to find the total weight and the total volume transported on Monday and on Tuesday. Find separate totals for each day. Put all of that information into a matrix.
7. Explain how you calculated the numbers for your matrix in Question 6.

