40. SUMMER OLYMPICS The top three countries in the final medal standings for the 2004 Summer Olympics were the United States, China, and Russia. Each gold medal is worth 3 points, each silver medal is worth 2 points, and each bronze medal is worth 1 point. Organize the information using matrices. How many points did each country score?

Medals Won

	Gold	Silver	Bronze
USA	35	39	29
China	32	17	14
Russia	27	27	38

41. TAKS REASONING Matrix S gives the numbers of three types of cars sold in February by two car dealers, dealer A and dealer B. Matrix P gives the profit for each type of car sold. Which matrix is defined, SP or PS? Find this matrix and explain what its elements represent.

Matrix *S*

	A	B
Compact	21	16
Mid-size	40	33
Full-size	15	19

Matrix *P*

	Compact	Mid-size	Full-size
Profit	\$650	\$825	\$1050

42. GRADING Your overall grade in math class is a weighted average of three components: homework, quizzes, and tests. Homework counts for 20% of your grade, quizzes count for 30%, and tests count for 50%. The spreadsheet below shows the grades on homework, quizzes, and tests for five students. Organize the information using a matrix, then multiply the matrix by a matrix of weights to find each student's overall grade.

	A	B	C	D
1	Name	Homework	Quizzes	Test
2	Jean	82	88	86
3	Ted	92	88	90
4	Pat	82	73	81
5	Al	74	75	78
6	Matt	88	92	90

43. MULTI-STEP PROBLEM Residents of a certain suburb commute to a nearby city either by driving or by using public transportation. Each year, 20% of those who drive switch to public transportation, and 5% of those who use public transportation switch to driving.

a. The information above can be represented by the *transition matrix*

$$T = \begin{bmatrix} 1-p & q \\ p & 1-q \end{bmatrix}$$

where p is the percent of commuters who switch from driving to public transportation and q is the percent of commuters who switch from public transportation to driving. (Both p and q are expressed as decimals.) Write a transition matrix for the given situation.

b. Suppose 5000 commuters drive and 8000 commuters take public transportation. Let M_0 be the following matrix:

$$M_0 = \begin{bmatrix} 5000 \\ 8000 \end{bmatrix}$$

Find $M_1 = TM_0$. What does this matrix represent?

c. Find $M_2 = TM_1$, $M_3 = TM_2$, and $M_4 = TM_3$. What do these matrices represent?