

PROBLEM SOLVING

EXAMPLE 3

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for Exs. 31–34

- 31. SNOWBOARD SALES** A sporting goods store sells snowboards in several different styles and lengths. The matrices below show the number of each type of snowboard sold in 2003 and 2004. Write a matrix giving the change in sales for each type of snowboard from 2003 to 2004.

	Sales for 2003				Sales for 2004			
	150 cm	155 cm	160 cm	165 cm	150 cm	155 cm	160 cm	165 cm
Freeride	$\left[\begin{array}{cccc} 32 & 42 & 29 & 20 \end{array} \right]$	$\left[\begin{array}{cccc} 32 & 47 & 30 & 19 \end{array} \right]$						
Alpine	$\left[\begin{array}{cccc} 12 & 17 & 25 & 16 \end{array} \right]$	$\left[\begin{array}{cccc} 5 & 16 & 20 & 14 \end{array} \right]$						
Freestyle	$\left[\begin{array}{cccc} 28 & 40 & 32 & 21 \end{array} \right]$	$\left[\begin{array}{cccc} 29 & 39 & 36 & 31 \end{array} \right]$						

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- 32. FUEL ECONOMY** A car dealership sells four different models of cars. The fuel economy (in miles per gallon) is shown below for each model. Organize the data using a matrix. Then write a new matrix giving the fuel economy figures for next year's models if each measure of fuel economy increases by 8%.

Economy car: 32 mpg in city driving, 40 mpg in highway driving

Mid-size car: 24 mpg in city driving, 34 mpg in highway driving

Mini-van: 18 mpg in city driving, 25 mpg in highway driving

SUV: 19 mpg in city driving, 22 mpg in highway driving

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- 33. TAKS REASONING** In a certain city, an electronics chain has a downtown store and a store in the mall. Each store carries three models of digital camera. Sales of the cameras for May and June are shown.

May Downtown sales: 31 of model A, 42 of model B, 18 of model C
Mall sales: 22 of model A, 25 of model B, 11 of model C

June Downtown sales: 25 of model A, 36 of model B, 12 of model C
Mall sales: 38 of model A, 32 of model B, 15 of model C

- Organize the information using two matrices M and J that represent the sales for May and June, respectively.
- Find $M + J$ and describe what this matrix sum represents.
- Write a matrix giving the average monthly sales for the two month period.



- 34. TAKS REASONING** The matrices below show the numbers of female athletes who participated in selected NCAA sports and the average team size for each sport during the 2000–2001 and 2001–2002 seasons. Does the matrix $A + B$ give meaningful information? *Explain.*

	2000–2001 (A)		2001–2002 (B)	
	Athletes	Team size	Athletes	Team size
Basketball	$\left[\begin{array}{cc} 14,439 & 14.5 \end{array} \right]$	$\left[\begin{array}{cc} 14,524 & 14.3 \end{array} \right]$	Basketball	$\left[\begin{array}{cc} 14,524 & 14.3 \end{array} \right]$
Gymnastics	$\left[\begin{array}{cc} 1,397 & 15.7 \end{array} \right]$	$\left[\begin{array}{cc} 1,440 & 16.2 \end{array} \right]$	Gymnastics	$\left[\begin{array}{cc} 1,440 & 16.2 \end{array} \right]$
Skiing	$\left[\begin{array}{cc} 526 & 11.9 \end{array} \right]$	$\left[\begin{array}{cc} 496 & 11.0 \end{array} \right]$	Skiing	$\left[\begin{array}{cc} 496 & 11.0 \end{array} \right]$
Soccer	$\left[\begin{array}{cc} 18,548 & 22.5 \end{array} \right]$	$\left[\begin{array}{cc} 19,467 & 22.4 \end{array} \right]$	Soccer	$\left[\begin{array}{cc} 19,467 & 22.4 \end{array} \right]$