

Solve the following problems.

- There are three convenience stores in Gambier. This week, Store I sold 88 loaves of bread, 48 quarts of milk, 16 jars of peanut butter and 112 pounds of cold cuts. Store II sold 105 loaves of bread, 72 quarts of milk, 21 jars of peanut butter, and 147 pounds of cold cuts. Store III sold 60 loaves of bread, 40 quarts of milk, no peanut butter, and 50 pounds of cold cuts.
 - Use a 3×4 matrix to express the sales information for the three stores.
 - During the following week, sales on these products increased by 25%; sales at Store II increase by $\frac{1}{3}$; and sales at Store III increased by 10%. Write the sales matrix for that week.
 - Write a matrix that represents total sales over the two-week period.
- Some of the fastest growing college sports for both men and women are soccer, rowing, and equestrian sports. In 1981-82, there were 80 women's college soccer teams, 43 rowing teams, and 7 equestrian teams. The numbers of men's college teams in these sports were 744, 48, and 2, respectively. In 1998-99, there were 926 women's soccer teams, 122 rowing teams, and 41 equestrian teams. The numbers of men's teams in these sports were 879, 70, and 33, respectively.
 - Express the information for the women's teams as a 3×2 matrix A .
 - Express the information for the men's teams as a 3×2 matrix B .
 - Find $A + B$ and explain what it means.
 - Suppose the number of women's teams in each sport has increased by 10% since 1998-99 (to the nearest whole number). Write a matrix C which expresses the new numbers.
- The tables below give the death rates (per million person trips) for male and female drivers for various ages and number of passengers.

Male Drivers				
	Number of passengers			
Age	0	1	2	≥ 3
16	2.61	4.39	6.29	9.08
17	1.63	2.77	4.61	6.92
30 - 59	.92	.75	.62	.54

Female Drivers				
	Number of passengers			
Age	0	1	2	≥ 3
16	1.38	1.72	1.94	3.31
17	1.26	1.48	2.82	2.28
30 - 59	.41	.33	.27	.40

- Write a matrix A for the death rate of male drivers.
- Write a matrix B for the death rate of female drivers.
- Use the matrices from above to write a matrix showing the difference between the death rate of males and females.

4. Given the following matrices find each of the requested matrices (if possible)

$$A = \begin{bmatrix} 4 & 10 \\ -2 & -3 \\ 6 & 9 \end{bmatrix} \quad B = \begin{bmatrix} 2 & 3 & -2 \\ 2 & 4 & 0 \\ 0 & 1 & 2 \end{bmatrix} \quad C = \begin{bmatrix} 5 & 0 \\ -1 & 3 \\ 4 & 7 \end{bmatrix}$$

$$D = \begin{bmatrix} 6 \\ 1 \\ 0 \end{bmatrix} \quad E = [1 \quad 3 \quad -4] \quad F = \begin{bmatrix} -1 & 4 \\ 3 & 7 \end{bmatrix}$$

$$G = \begin{bmatrix} 2 & 5 \\ 1 & 6 \end{bmatrix}$$

- (a) $-B$
 - (b) $-D$
 - (c) $3A - 2C$
 - (d) $F + 3G$
 - (e) $2B - 5C$
 - (f) $G - 2F$
 - (g) AG
 - (h) GA
 - (i) EB
 - (j) GF
 - (k) CA
 - (l) AGF
5. An office supply manufacturer makes two kinds of paper clips, standard and extra large. To make a unit of standard paper clips requires $1/4$ hour on a cutting machine and $1/2$ hour on a machine that shapes the clips. A unit of extra large papers clips requires $1/3$ hour on each machine.
- (a) Write this information as a 2×2 matrix.
 - (b) If 48 units of standard and 66 units of extra large clips are to be produces, use matrix multiplication to find our how many hours each machine will operate.