

**Determine the dimensions of each matrix product.**

1.  $A_{2 \times 3} \cdot B_{3 \times 5}$

$2 \times 5$

2.  $G_{4 \times 7} \cdot C_{7 \times 1}$

$4 \times 1$

3.  $M_{2 \times 2} \cdot N_{3 \times 2}$

not possible

**Multiply the following matrices, if possible.**

4.  $\begin{bmatrix} 2 & 3 \\ 4 & 7 \end{bmatrix} \cdot \begin{bmatrix} 6 & -8 \\ 12 & -5 \end{bmatrix}$

$\begin{bmatrix} 48 & -31 \\ 108 & -67 \end{bmatrix}$

5.  $\begin{bmatrix} 13 \\ 5 \\ 8 \end{bmatrix} \cdot \begin{bmatrix} 6 & \frac{2}{10} & \frac{11}{4} \end{bmatrix}$

$\begin{bmatrix} 78 & 17/5 & 143/4 \\ 30 & 1 & 55/4 \\ 48 & 8/5 & 22 \end{bmatrix}$

6.  $\begin{bmatrix} 9 & 8 \\ 4 & 3 \\ 5 & 6 \end{bmatrix} \cdot \begin{bmatrix} -10 & -2 \\ -3 & -4 \end{bmatrix}$

$\begin{bmatrix} -114 & -50 \\ -49 & -20 \\ -68 & -34 \end{bmatrix}$

7.  $\begin{bmatrix} -5 & 12 \\ 8 & -3 \\ -9 & -6 \end{bmatrix} \cdot \begin{bmatrix} 3 & -2 \\ -5 & 1 \\ 4 & 3 \end{bmatrix}$

not possible

8.  $\begin{bmatrix} 1 & 3 \\ 5 & 7 \end{bmatrix} \cdot \begin{bmatrix} 2 & -6 & 10 \\ 4 & -8 & 12 \end{bmatrix}$

$\begin{bmatrix} 14 & -30 & 46 \\ 38 & -86 & 134 \end{bmatrix}$

**Solve the following matrix multiplication word problems.**

9. On two days, a store sold the following amounts of pencils, erasers, and binders.

|         | Pencils | Erasers | Binders |
|---------|---------|---------|---------|
| Monday  | 48      | 7       | 9       |
| Tuesday | 54      | 10      | 6       |

If the price for each pencil, eraser, and binder, respectively, is \$0.20, \$0.35, and \$2.85, how much was made each day?

$\begin{bmatrix} 48 & 7 & 9 \\ 54 & 10 & 6 \end{bmatrix} \cdot \begin{bmatrix} .20 \\ .35 \\ 2.85 \end{bmatrix} = \begin{bmatrix} 37.7 \\ 31.4 \end{bmatrix}$

Monday = \$ 37.70  
 Tuesday = \$ 31.40

10. Old MacDonald has three fruit farms. On these farms he grows peaches, apricots, plums, and apples. When picked, the fruit is sorted into layered boxes in which they will be sold. The chart below shows the number of boxes for each type of fruit.

| Location | Peaches | Apricots | Plums | Apples |
|----------|---------|----------|-------|--------|
| Farm 1   | 152     | 225      | 395   | 277    |
| Farm 2   | 236     | 183      | 245   | 183    |
| Farm 3   | 95      | 132      | 0     | 285    |

$$\begin{bmatrix} 27 \\ 15 \\ 34 \\ 17 \end{bmatrix}$$

Suppose he sells peaches for \$27 a box, apricots for \$15 a box, plums for \$34 a box, and apples for \$17 a box. Find the income for each farm. How much will he make *total*?

$$= \begin{bmatrix} 25618 \\ 20558 \\ 9390 \end{bmatrix} \begin{matrix} \text{Farm 1} \\ \text{Farm 2} \\ \text{Farm 3} \end{matrix}$$


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\$ 55,566 Total income

11. In a three team track meet, the following numbers of 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place finishes were recorded.

| School  | First Place | Second Place | Third Place |
|---------|-------------|--------------|-------------|
| Lee     | 4           | 10           | 6           |
| Central | 7           | 6            | 9           |
| Clarke  | 8           | 3            | 4           |

$$\begin{bmatrix} 5 \\ 3 \\ 1 \end{bmatrix}$$

If 5 points are awarded for 1<sup>st</sup>, 3 points for 2<sup>nd</sup>, and 1 point for 3<sup>rd</sup>, determine who won the track meet.

$$= \begin{bmatrix} 56 \\ 62 \\ 53 \end{bmatrix} \begin{matrix} \text{Lee} \\ \text{Central} \\ \text{Clarke} \end{matrix}$$

The central school won the track meet with 62 points.