Chapter 13. Statistics

Ex. 13.2

Answer 1CU.

A 2 by 4 matrix has 2 rows and 4 columns. For example

$$A = \begin{bmatrix} 1 & 0 & -1 & 2 \\ 3 & 4 & 1 & 6 \end{bmatrix}$$

A 4 by 2 matrix has 4 rows and 2 columns. For example

$$B = \begin{bmatrix} 1 & 2 \\ -1 & 3 \\ 4 & 1 \\ 5 & 2 \end{bmatrix}$$

Answer 1PQ.

It is a random sample. Therefore the sample is **unbiased.**

The possible population for the sample will be:

All households in the neighborhood;

This is a systematic population because the persons are selected according to a specified time.

Answer 2PQ.

It is a random sample. Therefore the sample is **unbiased.**

The possible population for the sample will be:

All households in the neighborhood;

This is a simple random sample because the persons are likely to be chosen as any other from the population.

Answer 3CU.

Here Estrella is correct. Because when a matrix is multiply with a constant the entire elements of the matrix is multiply with that number.

Therefore when the matrix $\begin{bmatrix} -1 & 3 \\ -2 & 5 \end{bmatrix}$ is multiply with -5 the result will become

$$-5\begin{bmatrix} -1 & 3 \\ -2 & 5 \end{bmatrix} = \begin{bmatrix} (-5)(-1) & (-5)3 \\ (-5)(-2) & (-5)5 \end{bmatrix}$$

$$= \begin{bmatrix} 5 & -15 \\ 10 & -25 \end{bmatrix}$$

Hence Estrella is correct.

Answer 3PA.

Consider the matrices:

$$\begin{bmatrix} -8 & 3 \\ -4 & -9 \end{bmatrix} + \begin{bmatrix} 5 & -7 \\ -1 & 0 \end{bmatrix}$$

The sum of the two matrices can be written as follows:

$$\begin{aligned} \begin{bmatrix} -8 & 3 \\ -4 & -9 \end{bmatrix} + \begin{bmatrix} 5 & -7 \\ -1 & 0 \end{bmatrix} &= \begin{bmatrix} -8+3 & 3-7 \\ -4-1 & -9 \end{bmatrix} \\ &= \boxed{\begin{bmatrix} -5 & -4 \\ -5 & -9 \end{bmatrix}} \end{aligned}$$

Answer 4CU.

Consider the matrix:

$$A = \begin{bmatrix} 4 & \boxed{0} & 2 \\ 5 & -1 & -3 \\ 6 & 2 & 7 \end{bmatrix}$$

Here the matrix A has 3 rows and 3 columns, therefore the dimension of the matrix is 3 by 3.

The position of the element 0 in the matrix is 1st row 2nd column.

Answer 4PQ.

Consider the matrices:

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

The sum of the two matrices can be written as follows:

$$\begin{aligned} \begin{bmatrix} -9 & 6 & 4 \\ -1 & 3 & 2 \end{bmatrix} - \begin{bmatrix} 7 & -2 & 8 \\ 5 & -3 & 1 \end{bmatrix} &= \begin{bmatrix} -9-7 & 6-(-2) & 4-8 \\ -1-5 & 3-(-3) & 2-1 \end{bmatrix} \\ &= \boxed{\begin{bmatrix} -16 & 8 & -4 \\ -6 & 6 & 1 \end{bmatrix}} \end{aligned}$$

Answer 5CU.

Consider the matrix:

$$A = \begin{bmatrix} \boxed{3} & -3 & 1 & 9 \end{bmatrix}$$

Here the matrix A has 1 row and 4 columns, therefore the dimension of the matrix is 1 by 4.

The position of the element 3 in the matrix is 1st row 1st column.

Answer 5PQ.

Consider the matrices:

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

The sum of the two matrices can be written as follows:

$$3\begin{bmatrix} 8 & -3 & -4 & 5 \\ 6 & -1 & 2 & 10 \end{bmatrix} = \begin{bmatrix} 3\times8 & 3\times(-3) & 3\times(-4) & 3\times5 \\ 3\times6 & 3\times(-1) & 3\times2 & 3\times10 \end{bmatrix}$$
$$= \boxed{\begin{bmatrix} 24 & -9 & -12 & 15 \\ 18 & -3 & 6 & 30 \end{bmatrix}}$$

Answer 6CU.

Consider the matrix:

$$A = \begin{bmatrix} 5 \\ 2 \\ \boxed{1} \\ -3 \end{bmatrix}$$

Here the matrix *A* has 4 rows and 1 column, therefore the dimension of the matrix is 4 by 1.

The position of the element 1 in the matrix is 3rd row 1st column.

Answer 7CU.

Consider the matrix:

$$A = \begin{bmatrix} 0.6 & \boxed{4.2} \\ -1.7 & 1.05 \\ 0.625 & -2.1 \end{bmatrix}$$

Here the matrix *A* has 3 rows and 2 columns, therefore the dimension of the matrix is 3 by 2.

The position of the element 4.2 in the matrix is 1st row 2nd column.

Answer 8CU.

Consider the matrices:

$$A = \begin{bmatrix} 20 & -10 \\ 12 & 19 \end{bmatrix}, B = \begin{bmatrix} 15 & 14 \\ -10 & 6 \end{bmatrix} \text{ and } C = \begin{bmatrix} -5 & 7 \end{bmatrix}$$

To determine $A + C$ follows the steps:

Here *A* is a 2 by 2 matrix and *C* is a 1 by 2 matrix. Since the dimension of the two matrices is not same, therefore the addition of the matrix *A* and *C* is not possible.

Answer 9CU.

Consider the matrices:

$$A=\begin{bmatrix}20 & -10\\ 12 & 19\end{bmatrix}, B=\begin{bmatrix}15 & 14\\ -10 & 6\end{bmatrix} \text{ and } C=\begin{bmatrix}-5 & 7\end{bmatrix}$$

To determine $B-A$ follows the steps:

$$B-A=\begin{bmatrix}15 & 14\\ -10 & 6\end{bmatrix}-\begin{bmatrix}20 & -10\\ 12 & 19\end{bmatrix}$$

$$=\begin{bmatrix}15-20 & 14-(-10)\\ -10-12 & 6-19\end{bmatrix}$$

$$=\boxed{\begin{bmatrix}-5 & 24\\ -22 & -13\end{bmatrix}}$$

Answer 10CU.

Consider the matrices:

$$A=\begin{bmatrix}20 & -10\\ 12 & 19\end{bmatrix}, B=\begin{bmatrix}15 & 14\\ -10 & 6\end{bmatrix} \text{ and } C=\begin{bmatrix}-5 & 7\end{bmatrix}$$

To determine $2A$ follows the steps:

$$2A=2\begin{bmatrix}20 & -10\\ 12 & 19\end{bmatrix}$$

$$=\begin{bmatrix}2\times 20 & 2(-10)\\ 2\times 12 & 2\times 19\end{bmatrix}$$

$$=\boxed{\begin{bmatrix}40 & -20\\ 24 & 38\end{bmatrix}}$$

Answer 11CU.

Consider the matrices:

$$A=\begin{bmatrix}20 & -10\\ 12 & 19\end{bmatrix}, B=\begin{bmatrix}15 & 14\\ -10 & 6\end{bmatrix} \text{ and } C=\begin{bmatrix}-5 & 7\end{bmatrix}$$

To determine $2A$ follows the steps:

$$-4C=-4\begin{bmatrix}-5 & 7\end{bmatrix}$$

$$=\begin{bmatrix}(-4)(-5) & -4(7)\end{bmatrix}$$

$$=\boxed{\begin{bmatrix}20 & -28\end{bmatrix}}$$

Answer 12CU.

Consider the three days data:

FRIDAY	Small	Medium	Large
Thin Crust	12	10	3
Thick Crust	11	8	8
Deep Dish	14	8	10
SATURDAY	Small	Medium	Large
Thin Crust	13	12	11
Thick Crust	1	5	10
Deep Dish	8	11	2
SUNDAY	Small	Medium	Large
Thin Crust	11	8	6
Thick Crust	1	8	11
Deep Dish	10	15	11

The matrices for each day's data can be written as:

$$F = \begin{bmatrix} 12 & 10 & 3 \\ 11 & 8 & 8 \\ 14 & 8 & 10 \end{bmatrix}, R = \begin{bmatrix} 13 & 12 & 11 \\ 1 & 5 & 10 \\ 8 & 11 & 2 \end{bmatrix} \text{ and } N = \begin{bmatrix} 11 & 8 & 6 \\ 1 & 8 & 11 \\ 10 & 15 & 11 \end{bmatrix}$$

Answer 13CU.

Consider the three days data:

FRIDAY	Small	Medium	Large
Thin Crust	12	10	3
Thick Crust	11	8	8
Deep Dish	14	8	10
SATURDAY	Small	Medium	Large
Thin Crust	13	12	11
Thick Crust	1	5	10
Deep Dish	8	11	2
SUNDAY	Small	Medium	Large
Thin Crust	11	8	6
Thick Crust	1	8	11
Deep Dish	10	15	11

The matrices for each day's data are:

$$F = \begin{bmatrix} 12 & 10 & 3 \\ 11 & 8 & 8 \\ 14 & 8 & 10 \end{bmatrix}, R = \begin{bmatrix} 13 & 12 & 11 \\ 1 & 5 & 10 \\ 8 & 11 & 2 \end{bmatrix} \text{ and } N = \begin{bmatrix} 11 & 8 & 6 \\ 1 & 8 & 11 \\ 10 & 15 & 11 \end{bmatrix}$$

Here each element of matrix *F* is not equal to the corresponding elements of the matrix *R*.

Therefore the two matrices $F \neq R$.

Answer 14CU.

Consider the three days data:

FRIDAY	Small	Medium	Large
Thin Crust	12	10	3
Thick Crust	11	8	8
Deep Dish	14	8	10
SATURDAY	Small	Medium	Large
Thin Crust	13	12	11
Thick Crust	1	5	10
Deep Dish	8	11	2
SUNDAY	Small	Medium	Large
Thin Crust	11	8	6
Thick Crust	1	8	11
Deep Dish	10	15	11

The matrices for each day's data are:

$$F=\begin{bmatrix}12 & 10 & 3\\ 11 & 8 & 8\\ 14 & 8 & 10\end{bmatrix}, R=\begin{bmatrix}13 & 12 & 11\\ 1 & 5 & 10\\ 8 & 11 & 2\end{bmatrix} \text{ and } N=\begin{bmatrix}11 & 8 & 6\\ 1 & 8 & 11\\ 10 & 15 & 11\end{bmatrix}$$

The matrix T can be written as:

$$T = F + R + N$$

$$= \begin{bmatrix} 12 & 10 & 3 \\ 11 & 8 & 8 \\ 14 & 8 & 10 \end{bmatrix} + \begin{bmatrix} 13 & 12 & 11 \\ 1 & 5 & 10 \\ 8 & 11 & 2 \end{bmatrix} + \begin{bmatrix} 11 & 8 & 6 \\ 1 & 8 & 11 \\ 10 & 15 & 11 \end{bmatrix}$$

$$= \begin{bmatrix} 12+13 & 10+12 & 3+11 \\ 11+1 & 8+5 & 8+10 \\ 14+8 & 8+11 & 10+2 \end{bmatrix} + \begin{bmatrix} 11 & 8 & 6 \\ 1 & 8 & 11 \\ 10 & 15 & 11 \end{bmatrix}$$

$$= \begin{bmatrix} 25 & 22 & 14 \\ 12 & 13 & 18 \\ 22 & 19 & 12 \end{bmatrix} + \begin{bmatrix} 11 & 8 & 6 \\ 1 & 8 & 11 \\ 10 & 15 & 11 \end{bmatrix}$$

$$= \begin{bmatrix} 25+11 & 22+8 & 14+6 \\ 12+1 & 13+8 & 18+11 \\ 22+10 & 19+15 & 12+11 \end{bmatrix}$$

$$T = \boxed{\begin{bmatrix} 36 & 30 & 20 \\ 13 & 34 & 29 \\ 32 & 34 & 23 \end{bmatrix}}$$

Answer 15CU.

Consider the three days data:

FRIDAY	Small	Medium	Large
Thin Crust	12	10	3
Thick Crust	11	8	8
Deep Dish	14	8	10
SATURDAY	Small	Medium	Large
Thin Crust	13	12	11
Thick Crust	1	5	10
Deep Dish	8	11	2
SUNDAY	Small	Medium	Large
Thin Crust	11	8	6
Thick Crust	1	8	11
Deep Dish	10	15	11

The matrices for each day's data are:

$$F=\begin{bmatrix}12 & 10 & 3\\ 11 & 8 & 8\\ 14 & 8 & 10\end{bmatrix}, R=\begin{bmatrix}13 & 12 & 11\\ 1 & 5 & 10\\ 8 & 11 & 2\end{bmatrix} \text{ and } N=\begin{bmatrix}11 & 8 & 6\\ 1 & 8 & 11\\ 10 & 15 & 11\end{bmatrix}$$

The matrix T can be written as:

$$T=F+R+N$$

$$=\begin{bmatrix}12 & 10 & 3\\ 11 & 8 & 8\\ 14 & 8 & 10\end{bmatrix}+\begin{bmatrix}13 & 12 & 11\\ 1 & 5 & 10\\ 8 & 11 & 2\end{bmatrix}+\begin{bmatrix}11 & 8 & 6\\ 1 & 8 & 11\\ 10 & 15 & 11\end{bmatrix}$$

$$=\begin{bmatrix}12+13 & 10+12 & 3+11\\ 11+1 & 8+5 & 8+10\\ 14+8 & 8+11 & 10+2\end{bmatrix}+\begin{bmatrix}11 & 8 & 6\\ 1 & 8 & 11\\ 10 & 15 & 11\end{bmatrix}$$

$$=\begin{bmatrix}25 & 22 & 14\\ 12 & 13 & 18\\ 22 & 19 & 12\end{bmatrix}+\begin{bmatrix}11 & 8 & 6\\ 1 & 8 & 11\\ 10 & 15 & 11\end{bmatrix}$$

$$=\begin{bmatrix}25+11 & 22+8 & 14+6\\ 12+1 & 13+8 & 18+11\\ 22+10 & 19+15 & 12+11\end{bmatrix}$$

$$T=\boxed{\begin{bmatrix}36 & 30 & 20\\ 13 & 34 & 29\\ 32 & 34 & 23\end{bmatrix}}$$

Here the matrix T represents the total numbers of Pizza sold in one weekend.

Answer 16CU.

Consider the three days data:

FRIDAY	Small	Medium	Large
Thin Crust	12	10	3
Thick Crust	11	8	8
Deep Dish	14	8	10
SATURDAY	Small	Medium	Large
Thin Crust	13	12	11
Thick Crust	1	5	10
Deep Dish	8	11	2
SUNDAY	Small	Medium	Large
Thin Crust	11	8	6
Thick Crust	1	8	11
Deep Dish	10	15	11

The matrices for each day's data are:

$$F=\begin{bmatrix}12 & 10 & 3\\ 11 & 8 & 8\\ 14 & 8 & 10\end{bmatrix}, R=\begin{bmatrix}13 & 12 & 11\\ 1 & 5 & 10\\ 8 & 11 & 2\end{bmatrix} \text{ and } N=\begin{bmatrix}11 & 8 & 6\\ 1 & 8 & 11\\ 10 & 15 & 11\end{bmatrix}$$

The matrix T can be written as:

$$\begin{aligned}
T &= F+R+N\\
&=\begin{bmatrix}12 & 10 & 3\\ 11 & 8 & 8\\ 14 & 8 & 10\end{bmatrix}+\begin{bmatrix}13 & 12 & 11\\ 1 & 5 & 10\\ 8 & 11 & 2\end{bmatrix}+\begin{bmatrix}11 & 8 & 6\\ 1 & 8 & 11\\ 10 & 15 & 11\end{bmatrix}\\
&=\begin{bmatrix}12+13 & 10+12 & 3+11\\ 11+1 & 8+5 & 8+10\\ 14+8 & 8+11 & 10+2\end{bmatrix}+\begin{bmatrix}11 & 8 & 6\\ 1 & 8 & 11\\ 10 & 15 & 11\end{bmatrix}\\
&=\begin{bmatrix}25 & 22 & 14\\ 12 & 13 & 18\\ 22 & 19 & 12\end{bmatrix}+\begin{bmatrix}11 & 8 & 6\\ 1 & 8 & 11\\ 10 & 15 & 11\end{bmatrix}\\
&=\begin{bmatrix}25+11 & 22+8 & 14+6\\ 12+1 & 13+8 & 18+11\\ 22+10 & 19+15 & 12+11\end{bmatrix}\\
T &=\begin{bmatrix}\boxed{36} & 30 & 20\\ 13 & 34 & 29\\ 32 & 34 & 23\end{bmatrix}
\end{aligned}$$

The maximum value of the T is 36. This indicates the **small sized-thin crust pizza** had the most sales during the entire weekend.

Answer 17PA.

Consider the matrix:

$$A=\begin{bmatrix}\boxed{2} & 1\\ 5 & -8\end{bmatrix}$$

Here the matrix A has 2 rows and 2 columns, therefore the dimension of the matrix is 2 by 2.

The position of the element 2 in the matrix is 1st row 1st column.

Answer 18PA.

Consider the matrix:

$$A = \begin{bmatrix} -36 & 3 \\ \boxed{25} & -1 \\ 11 & 14 \end{bmatrix}$$

Here the matrix *A* has 3 rows and 2 columns, therefore the dimension of the matrix is 3 by 2.

The position of the element 25 in the matrix is 2nd row 1st column.

Answer 19PA.

Consider the matrix:

$$A = \begin{bmatrix} 1 \\ 0 \\ \boxed{-1} \end{bmatrix}$$

Here the matrix *A* has 3 rows and 1 columns, therefore the dimension of the matrix is 3 by 1.

The position of the element -1 in the matrix is 3rd row 1st column.

Answer 20PA.

Consider the matrix:

$$A = \begin{bmatrix} -3 & 56 & -21 \\ 60 & \boxed{112} & -65 \end{bmatrix}$$

Here the matrix *A* has 2 rows and 3 columns, therefore the dimension of the matrix is 2 by 3.

The position of the element 112 in the matrix is 2nd row 2nd column.

Answer 21PA.

Consider the matrix:

$$A = \begin{bmatrix} -4 & 0 & -2 \\ 5 & 1 & \boxed{12} \\ -6 & 3 & -7 \end{bmatrix}$$

Here the matrix *A* has 3 rows and 3 columns, therefore the dimension of the matrix is 3 by 3.

The position of the element 12 in the matrix is 2nd row 3rd column.

Answer 22PA.

Consider the matrix:

$$A = \begin{bmatrix} 1 & -2 \\ 3 & 4 \\ 1 & 5 \\ \boxed{-1} & 7 \end{bmatrix}$$

Here the matrix *A* has 4 rows and 2 columns, therefore the dimension of the matrix is 4 by 2.

The position of the element -1 in the matrix is 4th row 1st column.

Answer 23PA.

Consider the matrix:

$$A = \begin{bmatrix} -5 & 3 & 1 \\ 4 & 0 & \boxed{2} \end{bmatrix}$$

Here the matrix *A* has 2 rows and 3 columns, therefore the dimension of the matrix is 2 by 3.

The position of the element 2 in the matrix is 2nd row 3rd column.

Answer 24PA.

Consider the matrix:

$$A = \begin{bmatrix} -6 & 3 \\ \boxed{5} & -4 \end{bmatrix}$$

Here the matrix *A* has 2 rows and 2 columns, therefore the dimension of the matrix is 2 by 2.

The position of the element 5 in the matrix is 2nd row 1st column.

Answer 25PA.

It is given that a 2 by 3 matrix has 2 in the 1st row and 1st column and 5 in the 2nd row 2nd column and the rest elements are 1.

Therefore the required matrix can be constructed as follows:

$$\boxed{A = \begin{bmatrix} 2 & 1 & 1 \\ 1 & 2 & 1 \end{bmatrix}}$$

Answer 26PA.

It is given that a 3 by 2 matrix has 8 in the 2nd row and 2nd column and 4 in the 3rd row 2nd column and the rest elements are 0.

Therefore the required matrix can be constructed as follows:

$$\boxed{A=\begin{bmatrix}0 & 0\\ 0 & 8\\ 0 & 4\end{bmatrix}}$$

Answer 27PA.

Consider the matrices:

$$A=\begin{bmatrix}-1 & 5 & 9\\ 0 & -4 & -2\\ 3 & 7 & 6\end{bmatrix}, B=\begin{bmatrix}-12 & 7 & -16\\ 5 & 10 & 13\\ 20 & 11 & 8\end{bmatrix}, C=\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}$$

$$D=\begin{bmatrix}-52 & 9 & 70\\ -49 & -8 & 45\end{bmatrix}$$

Since *A* and *B* has the same dimension, therefore $A+B$ will be:

$$A+B=\begin{bmatrix}-1 & 5 & 9\\ 0 & -4 & -2\\ 3 & 7 & 6\end{bmatrix}+\begin{bmatrix}-12 & 7 & -16\\ 5 & 10 & 13\\ 20 & 11 & 8\end{bmatrix}$$

$$=\begin{bmatrix}-1-12 & 5+7 & 9-16\\ 0+5 & -4+10 & -2+13\\ 3+20 & 7+11 & 6+8\end{bmatrix}$$

$$=\boxed{\begin{bmatrix}-13 & 12 & -7\\ 5 & 6 & 11\\ 23 & 18 & 14\end{bmatrix}}$$

Answer 28PA.

Consider the matrices:

$$A=\begin{bmatrix}-1 & 5 & 9\\ 0 & -4 & -2\\ 3 & 7 & 6\end{bmatrix}, B=\begin{bmatrix}-12 & 7 & -16\\ 5 & 10 & 13\\ 20 & 11 & 8\end{bmatrix}, C=\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}$$

$$D=\begin{bmatrix}-52 & 9 & 70\\ -49 & -8 & 45\end{bmatrix}$$

Since C and D has the same dimension, therefore $C+D$ will be:

$$\begin{aligned}C+D&=\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}+\begin{bmatrix}-52 & 9 & 70\\ -49 & -8 & 45\end{bmatrix}\\ &=\begin{bmatrix}34-52 & 91+9 & 63+70\\ 81-49 & 79-8 & 60+45\end{bmatrix}\\ &=\boxed{\begin{bmatrix}-18 & 100 & 133\\ 32 & 71 & 105\end{bmatrix}}\end{aligned}$$

Answer 29PA.

Consider the matrices:

$$A=\begin{bmatrix}-1 & 5 & 9\\ 0 & -4 & -2\\ 3 & 7 & 6\end{bmatrix}, B=\begin{bmatrix}-12 & 7 & -16\\ 5 & 10 & 13\\ 20 & 11 & 8\end{bmatrix}, C=\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}$$

$$D=\begin{bmatrix}-52 & 9 & 70\\ -49 & -8 & 45\end{bmatrix}$$

Since C and D has the same dimension, therefore $C-D$ will be:

$$\begin{aligned}C-D&=\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}-\begin{bmatrix}-52 & 9 & 70\\ -49 & -8 & 45\end{bmatrix}\\ &=\begin{bmatrix}34-(-52) & 91-9 & 63-70\\ 81+(-49) & 79-(-8) & 60-45\end{bmatrix}\\ &=\boxed{\begin{bmatrix}86 & 82 & -7\\ 130 & 87 & 15\end{bmatrix}}\end{aligned}$$

Answer 30PA.

Consider the matrices:

$$A=\begin{bmatrix}-1&5&9\\0&-4&-2\\3&7&6\end{bmatrix}, B=\begin{bmatrix}-12&7&-16\\5&10&13\\20&11&8\end{bmatrix}, C=\begin{bmatrix}34&91&63\\81&79&60\end{bmatrix}$$

$$D=\begin{bmatrix}-52&9&70\\-49&-8&45\end{bmatrix}$$

Since *A* and *B* has the same dimension, therefore $B-A$ will be:

$$B-A=\begin{bmatrix}-12&7&-16\\5&10&13\\20&11&8\end{bmatrix}-\begin{bmatrix}-1&5&9\\0&-4&-2\\3&7&6\end{bmatrix}$$

$$=\begin{bmatrix}-12-(-1)&7-5&-16-9\\5-0&10-(-4)&13-(-2)\\20-3&11-7&8-6\end{bmatrix}$$

$$=\boxed{\begin{bmatrix}-11&2&-25\\5&14&15\\17&4&2\end{bmatrix}}$$

Answer 431PA.

Consider the matrices:

$$A=\begin{bmatrix}-1&5&9\\0&-4&-2\\3&7&6\end{bmatrix}, B=\begin{bmatrix}-12&7&-16\\5&10&13\\20&11&8\end{bmatrix}, C=\begin{bmatrix}34&91&63\\81&79&60\end{bmatrix}$$

$$D=\begin{bmatrix}-52&9&70\\-49&-8&45\end{bmatrix}$$

To determine the matrix 5*A* follows the steps:

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

$$=\begin{bmatrix}5(-1)&5(5)&5\times 9\\5\times 0&5\times(-4)&5\times(-2)\\5\times 3&5\times 7&5\times 6\end{bmatrix}$$

$$=\boxed{\begin{bmatrix}-5&25&45\\0&-20&-10\\15&35&30\end{bmatrix}}$$

Answer 32PA.

Consider the matrices:

$$A=\begin{bmatrix}-1 & 5 & 9\\ 0 & -4 & -2\\ 3 & 7 & 6\end{bmatrix}, B=\begin{bmatrix}-12 & 7 & -16\\ 5 & 10 & 13\\ 20 & 11 & 8\end{bmatrix}, C=\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}$$

$$D=\begin{bmatrix}-52 & 9 & 70\\ -49 & -8 & 45\end{bmatrix}$$

To determine the matrix $2C$ follows the steps:

$$2C=2\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}$$

$$=\begin{bmatrix}2\times34 & 2\times91 & 2\times63\\ 2\times81 & 2\times79 & 2\times60\end{bmatrix}$$

$$=\boxed{\begin{bmatrix}68 & 182 & 126\\ 162 & 158 & 120\end{bmatrix}}$$

Answer 33PA.

Consider the matrices:

$$A=\begin{bmatrix}-1 & 5 & 9\\ 0 & -4 & -2\\ 3 & 7 & 6\end{bmatrix}, B=\begin{bmatrix}-12 & 7 & -16\\ 5 & 10 & 13\\ 20 & 11 & 8\end{bmatrix}, C=\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}$$

$$D=\begin{bmatrix}-52 & 9 & 70\\ -49 & -8 & 45\end{bmatrix}$$

To determine the matrix $A+C$ follows the steps:

The dimension of the matrix A is 3 by 3 and the dimension of the matrix C is 2 by 3.

Since both the dimensions are not same, therefore $A+C$ is not possible.

Answer 34PA.

Consider the matrices:

$$A=\begin{bmatrix}-1 & 5 & 9\\ 0 & -4 & -2\\ 3 & 7 & 6\end{bmatrix}, B=\begin{bmatrix}-12 & 7 & -16\\ 5 & 10 & 13\\ 20 & 11 & 8\end{bmatrix}, C=\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}$$

$$D=\begin{bmatrix}-52 & 9 & 70\\ -49 & -8 & 45\end{bmatrix}$$

To determine the matrix $B+D$ follows the steps:

The dimension of the matrix B is 3 by 3 and the dimension of the matrix D is 2 by 3.

Since both the dimensions are not same, therefore $B+D$ is not possible.

Answer 35PA.

Consider the matrices:

$$A=\begin{bmatrix}-1 & 5 & 9\\ 0 & -4 & -2\\ 3 & 7 & 6\end{bmatrix}, B=\begin{bmatrix}-12 & 7 & -16\\ 5 & 10 & 13\\ 20 & 11 & 8\end{bmatrix}, C=\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}$$

$$D=\begin{bmatrix}-52 & 9 & 70\\ -49 & -8 & 45\end{bmatrix}$$

To determine the matrix $2B+A$ follows the steps:

$$2B+A=2\begin{bmatrix}-12 & 7 & -16\\ 5 & 10 & 13\\ 20 & 11 & 8\end{bmatrix}+\begin{bmatrix}-1 & 5 & 9\\ 0 & -4 & -2\\ 3 & 7 & 6\end{bmatrix}$$

$$=\begin{bmatrix}-24 & 14 & -32\\ 10 & 20 & 26\\ 40 & 22 & 16\end{bmatrix}+\begin{bmatrix}-1 & 5 & 9\\ 0 & -4 & -2\\ 3 & 7 & 6\end{bmatrix}$$

$$=\begin{bmatrix}-24-1 & 14+5 & -32+9\\ 10+0 & 20-4 & 26-2\\ 40+3 & 22+7 & 16+6\end{bmatrix}$$

$$=\boxed{\begin{bmatrix}-25 & 19 & -23\\ 10 & 16 & 24\\ 43 & 29 & 22\end{bmatrix}}$$

Answer 36PA.

Consider the matrices:

$$A=\begin{bmatrix}-1 & 5 & 9\\ 0 & -4 & -2\\ 3 & 7 & 6\end{bmatrix}, B=\begin{bmatrix}-12 & 7 & -16\\ 5 & 10 & 13\\ 20 & 11 & 8\end{bmatrix}, C=\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}$$

$$D=\begin{bmatrix}-52 & 9 & 70\\ -49 & -8 & 45\end{bmatrix}$$

To determine the matrix $4A-B$ follows the steps:

$$\begin{aligned}4A-B&=4\begin{bmatrix}-1 & 5 & 9\\ 0 & -4 & -2\\ 3 & 7 & 6\end{bmatrix}-\begin{bmatrix}-12 & 7 & -16\\ 5 & 10 & 13\\ 20 & 11 & 8\end{bmatrix}\\ &=\begin{bmatrix}-4 & 20 & 36\\ 0 & -16 & -8\\ 12 & 28 & 24\end{bmatrix}-\begin{bmatrix}-12 & 7 & -16\\ 5 & 10 & 13\\ 20 & 11 & 8\end{bmatrix}\\ &=\begin{bmatrix}-4-(-12) & 20-7 & 36-(-16)\\ 0-5 & -16-5 & -8-13\\ 12-20 & 28-11 & 24-8\end{bmatrix}\\ &=\boxed{\begin{bmatrix}8 & 13 & 52\\ -5 & -21 & -21\\ -8 & 17 & 16\end{bmatrix}}\end{aligned}$$

Answer 37PA.

Consider the matrices:

$$A=\begin{bmatrix}-1 & 5 & 9\\ 0 & -4 & -2\\ 3 & 7 & 6\end{bmatrix}, B=\begin{bmatrix}-12 & 7 & -16\\ 5 & 10 & 13\\ 20 & 11 & 8\end{bmatrix}, C=\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}$$

$$D=\begin{bmatrix}-52 & 9 & 70\\ -49 & -8 & 45\end{bmatrix}$$

To determine the matrix $2C-3D$ follows the steps:

$$\begin{aligned}2C-3D&=2\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}-3\begin{bmatrix}-52 & 9 & 70\\ -49 & -8 & 45\end{bmatrix}\\ &=\begin{bmatrix}68 & 182 & 126\\ 162 & 158 & 120\end{bmatrix}-\begin{bmatrix}-156 & 27 & 210\\ 147 & -24 & 135\end{bmatrix}\\ &=\begin{bmatrix}68-(-156) & 182-27 & 126-210\\ 162-147 & 158-(-24) & 120-135\end{bmatrix}\\ &=\boxed{\begin{bmatrix}224 & 155 & -84\\ 15 & 182 & -15\end{bmatrix}}\end{aligned}$$

Answer 38PA.

Consider the matrices:

$$A=\begin{bmatrix}-1 & 5 & 9\\ 0 & -4 & -2\\ 3 & 7 & 6\end{bmatrix}, B=\begin{bmatrix}-12 & 7 & -16\\ 5 & 10 & 13\\ 20 & 11 & 8\end{bmatrix}, C=\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}$$

$$D=\begin{bmatrix}-52 & 9 & 70\\ -49 & -8 & 45\end{bmatrix}$$

To determine the matrix $5D+2C$ follows the steps:

$$\begin{aligned}5D+2C &= 5\begin{bmatrix}-52 & 9 & 70\\ -49 & -8 & 45\end{bmatrix}+2\begin{bmatrix}34 & 91 & 63\\ 81 & 79 & 60\end{bmatrix}\\ &= \begin{bmatrix}-260 & 45 & 350\\ -98 & -40 & 225\end{bmatrix}+\begin{bmatrix}68 & 182 & 126\\ 162 & 158 & 120\end{bmatrix}\\ &= \begin{bmatrix}-260+68 & 45+182 & 350+126\\ -98+162 & -40+158 & 225+120\end{bmatrix}\\ &= \boxed{\begin{bmatrix}-192 & 227 & 476\\ 64 & 118 & 345\end{bmatrix}}\end{aligned}$$

Answer 39PA.

Consider the table:

Food	Calories	Protein(grams)	Fat(grams)	Saturated Fat(grams)
Fish Stick	70	6	3	0.8
Vegetable Soup(1 cup)	70	2	2	0.3
Soft Drink(12 oz)	160	0	0	0
Chocolate-Chip Cookie	185	2	11	3.9

It is given that the nutritional value of fish stick is represented by the matrix *F* is given as:

$$F=\begin{bmatrix}70 & 6 & 3 & 0.8\end{bmatrix}$$

Therefore the other matrices that represent the vegetable soup, soft drink and chocolate chip cookie can be represented by:

$$\boxed{V=\begin{bmatrix}70 & 2 & 2 & 0.3\end{bmatrix}, S=\begin{bmatrix}160 & 0 & 0 & 0\end{bmatrix} \text{ and } C=\begin{bmatrix}185 & 2 & 11 & 3.9\end{bmatrix}}$$

Answer 40PA.

Consider the table:

Food	Calories	Protein(grams)	Fat(grams)	Saturated Fat(grams)
Fish Stick	70	6	3	0.8
Vegetable Soup(1 cup)	70	2	2	0.3
Soft Drink(12 oz)	160	0	0	0
Chocolate-Chip Cookie	185	2	11	3.9

It is given that the nutritional value of fish stick is represented by the matrix *F* is given as:

$$F = \begin{bmatrix} 70 & 6 & 3 & 0.8 \end{bmatrix}$$

Since Lakeisha has two fish sticks for lunch, therefore the matrix representing the nutritional value of the fish sticks will be:

$$\begin{aligned} 2F &= 2\begin{bmatrix} 70 & 6 & 3 & 0.8 \end{bmatrix} \\ &= \begin{bmatrix} 2\times 70 & 2\times 6 & 2\times 3 & 2\times 0.8 \end{bmatrix} \\ &= \boxed{\begin{bmatrix} 140 & 12 & 6 & 1.6 \end{bmatrix}} \end{aligned}$$

Answer 41PA.

Consider the table:

Food	Calories	Protein(grams)	Fat(grams)	Saturated Fat(grams)
Fish Stick	70	6	3	0.8
Vegetable Soup(1 cup)	70	2	2	0.3
Soft Drink(12 oz)	160	0	0	0
Chocolate-Chip Cookie	185	2	11	3.9

It is given that the nutritional value of fish stick is represented by the matrix *F* is given as:

$$F = \begin{bmatrix} 70 & 6 & 3 & 0.8 \end{bmatrix}$$

The other matrices that represent the vegetable soup, soft drink and chocolate chip cookie can be represented by:

$$V = \begin{bmatrix} 70 & 2 & 2 & 0.3 \end{bmatrix}, S = \begin{bmatrix} 160 & 0 & 0 & 0 \end{bmatrix} \text{ and } C = \begin{bmatrix} 185 & 2 & 11 & 3.9 \end{bmatrix}$$

Answer 42PA.

Consider the table that shows the last year sales of *T*-shirts:

Color	XS	S	M	L	XL
Red	18	28	32	24	21
White	24	30	45	47	25
Blue	17	19	26	30	28

Not the matrix that shows the number of *T*-shirts sold last year according to size and color can be written as:

$$N = \boxed{\begin{bmatrix} 18 & 28 & 32 & 24 & 21 \\ 24 & 30 & 45 & 47 & 25 \\ 17 & 19 & 26 & 30 & 28 \end{bmatrix}}$$

Answer 43PA.

Consider the table that shows the last year sales of *T*-shirts:

Color	XS	S	M	L	XL
Red	18	28	32	24	21
White	24	30	45	47	25
Blue	17	19	26	30	28

Not the matrix that shows the number of *T*-shirts sold last year according to size and color can be written as:

$$N = \begin{bmatrix} 18 & 28 & 32 & 24 & 21 \\ 24 & 30 & 45 & 47 & 25 \\ 17 & 19 & 26 & 30 & 28 \end{bmatrix}$$

It is given that the student council anticipates a 20% increase in *T*-shirts sales. Therefore the sales of the *T*-shirts were 100, then now it will be increase up to 120.

Therefore necessary value of *r* will be:

$$r = \frac{120}{100}$$
$$= \boxed{1.2}$$

Answer 44PA.

Consider the table that shows the last year sales of *T*-shirts:

Color	XS	S	M	L	XL
Red	18	28	32	24	21
White	24	30	45	47	25
Blue	17	19	26	30	28

Not the matrix that shows the number of *T*-shirts sold last year according to size and color can be written as:

$$N = \begin{bmatrix} 18 & 28 & 32 & 24 & 21 \\ 24 & 30 & 45 & 47 & 25 \\ 17 & 19 & 26 & 30 & 28 \end{bmatrix}$$

It is given that the student council anticipates a 20% increase in *T*-shirts sales. Therefore the sales of the *T*-shirts were 100, then now it will be increase up to 120.

Therefore necessary value of r will be:

$$\begin{aligned} r &= \frac{120}{100} \\ &= 1.2 \end{aligned}$$

Thus the matrix rN will be:

$$\begin{aligned} rN &= 1.2\begin{bmatrix} 18 & 28 & 32 & 24 & 21 \\ 24 & 30 & 45 & 47 & 25 \\ 17 & 19 & 26 & 30 & 28 \end{bmatrix} \\ &= \begin{bmatrix} 1.2\times18 & 1.2\times28 & 1.2\times32 & 1.2\times24 & 1.2\times21 \\ 1.2\times24 & 1.2\times30 & 1.2\times45 & 1.2\times47 & 1.2\times25 \\ 1.2\times17 & 1.2\times19 & 1.2\times26 & 1.2\times30 & 1.2\times28 \end{bmatrix} \\ &= \boxed{\begin{bmatrix} 22 & 34 & 38 & 29 & 25 \\ 29 & 36 & 54 & 56 & 30 \\ 20 & 23 & 29 & 36 & 34 \end{bmatrix}} \end{aligned}$$

Answer 45PA.

Consider the table:

1999 Regular Season

Quarterback	Attempts	Completions	Passing Yards	Touchdowns	Interceptions
Peyton Manning	533	331	4135	26	15
Rich Gannon	515	304	3840	24	14
Kurt Warner	499	325	4353	41	13
Steve Beuerlein	571	343	4436	36	15

2000 Regular Season

Quarterback	Attempts	Completions	Passing Yards	Touchdowns	Interceptions
Peyton Manning	571	357	4413	33	15
Rich Gannon	473	284	3430	28	11
Kurt Warner	347	235	3429	21	18
Steve Beuerlein	533	324	3730	19	18

Now matrix *A* for the 1999 data and matrix *B* for the 2000 data can be written as:

$$A = \begin{bmatrix} 533 & 331 & 4135 & 26 & 15 \\ 515 & 304 & 3840 & 24 & 14 \\ 499 & 325 & 4353 & 41 & 13 \\ 571 & 343 & 4436 & 36 & 15 \end{bmatrix}, B = \begin{bmatrix} 571 & 357 & 4413 & 33 & 15 \\ 473 & 284 & 3430 & 28 & 11 \\ 347 & 235 & 3429 & 21 & 18 \\ 533 & 324 & 3730 & 19 & 18 \end{bmatrix}$$

Answer 46PA.

Consider the table:

1999 Regular Season

Quarterback	Attempts	Completions	Passing Yards	Touchdowns	Interceptions
Peyton Manning	533	331	4135	26	15
Rich Gannon	515	304	3840	24	14
Kurt Warner	499	325	4353	41	13
Steve Beuerlein	571	343	4436	36	15

2000 Regular Season

Quarterback	Attempts	Completions	Passing Yards	Touchdowns	Interceptions
Peyton Manning	571	357	4413	33	15
Rich Gannon	473	284	3430	28	11
Kurt Warner	347	235	3429	21	18
Steve Beuerlein	533	324	3730	19	18

Answer 47PA.

Consider the table:

1999 Regular Season

Quarterback	Attempts	Completions	Passing Yards	Touchdowns	Interceptions
Peyton Manning	533	331	4135	26	15
Rich Gannon	515	304	3840	24	14
Kurt Warner	499	325	4353	41	13
Steve Beuerlein	571	343	4436	36	15

2000 Regular Season

Quarterback	Attempts	Completions	Passing Yards	Touchdowns	Interceptions
Peyton Manning	571	357	4413	33	15
Rich Gannon	473	284	3430	28	11
Kurt Warner	347	235	3429	21	18
Steve Beuerlein	533	324	3730	19	18

Now matrix A for the 1999 data and matrix B for the 2000 data can be written as:

$$A=\begin{bmatrix}533 & 331 & 4135 & 26 & 15\\ 515 & 304 & 3840 & 24 & 14\\ 499 & 325 & 4353 & 41 & 13\\ 571 & 343 & 4436 & 36 & 15\end{bmatrix}, B=\begin{bmatrix}571 & 357 & 4413 & 33 & 15\\ 473 & 284 & 3430 & 28 & 11\\ 347 & 235 & 3429 & 21 & 18\\ 533 & 324 & 3730 & 19 & 18\end{bmatrix}$$

To find $T=A+B$ follows the steps:

$$\begin{aligned}T&=A+B\\ &=\begin{bmatrix}533 & 331 & 4135 & 26 & 15\\ 515 & 304 & 3840 & 24 & 14\\ 499 & 325 & 4353 & 41 & 13\\ 571 & 343 & 4436 & 36 & 15\end{bmatrix}+\begin{bmatrix}571 & 357 & 4413 & 33 & 15\\ 473 & 284 & 3430 & 28 & 11\\ 347 & 235 & 3429 & 21 & 18\\ 533 & 324 & 3730 & 19 & 18\end{bmatrix}\\ &=\begin{bmatrix}533+571 & 331+357 & 4135+4413 & 26+33 & 15+15\\ 515+473 & 304+284 & 3840+3430 & 24+28 & 14+11\\ 499+347 & 325+235 & 4353+3429 & 41+21 & 13+18\\ 571+533 & 343+324 & 4436+3730 & 36+19 & 15+18\end{bmatrix}\\ &=\boxed{\begin{bmatrix}1140 & 688 & 8548 & 59 & 30\\ 988 & 588 & 7270 & 52 & 25\\ 846 & 560 & 7782 & 62 & 31\\ 1104 & 667 & 8166 & 55 & 33\end{bmatrix}}\end{aligned}$$

Answer 48PA.

Consider the table:

1999 Regular Season

Quarterback	Attempts	Completions	Passing Yards	Touchdowns	Interceptions
Peyton Manning	533	331	4135	26	15
Rich Gannon	515	304	3840	24	14
Kurt Warner	499	325	4353	41	13
Steve Beuerlein	571	343	4436	36	15

2000 Regular Season

Quarterback	Attempts	Completions	Passing Yards	Touchdowns	Interceptions
Peyton Manning	571	357	4413	33	15
Rich Gannon	473	284	3430	28	11
Kurt Warner	347	235	3429	21	18
Steve Beuerlein	533	324	3730	19	18

Now matrix *A* for the 1999 data and matrix *B* for the 2000 data can be written as:

$$A=\begin{bmatrix}533 & 331 & 4135 & 26 & 15\\ 515 & 304 & 3840 & 24 & 14\\ 499 & 325 & 4353 & 41 & 13\\ 571 & 343 & 4436 & 36 & 15\end{bmatrix}, B=\begin{bmatrix}571 & 357 & 4413 & 33 & 15\\ 473 & 284 & 3430 & 28 & 11\\ 347 & 235 & 3429 & 21 & 18\\ 533 & 324 & 3730 & 19 & 18\end{bmatrix}$$

To find $T=A+B$ follows the steps:

$$T=A+B$$

$$=\begin{bmatrix}533 & 331 & 4135 & 26 & 15\\ 515 & 304 & 3840 & 24 & 14\\ 499 & 325 & 4353 & 41 & 13\\ 571 & 343 & 4436 & 36 & 15\end{bmatrix}+\begin{bmatrix}571 & 357 & 4413 & 33 & 15\\ 473 & 284 & 3430 & 28 & 11\\ 347 & 235 & 3429 & 21 & 18\\ 533 & 324 & 3730 & 19 & 18\end{bmatrix}$$

$$=\begin{bmatrix}533+571 & 331+357 & 4135+4413 & 26+33 & 15+15\\ 515+473 & 304+284 & 3840+3430 & 24+28 & 14+11\\ 499+347 & 325+235 & 4353+3429 & 41+21 & 13+18\\ 571+533 & 343+324 & 4436+3730 & 36+19 & 15+18\end{bmatrix}$$

$$=\begin{bmatrix}1140 & 688 & 8548 & 59 & 30\\ 988 & 588 & 7270 & 52 & 25\\ 846 & 560 & 7782 & 62 & 31\\ 1104 & 667 & 8166 & 55 & 33\end{bmatrix}$$

Here the Matrix *T* represents the passing performance of four National Football League quarterbacks for the year 1999 and 2000.

Answer 49PA.

It is given that *M* and *N* are two 3 by 3 matrices.

It is given that $M=N$. The statement is **sometimes true** when the matrices *M* and *N* are equal.

It is given that $M+N=N+M$. The statement is **always true** for any matrix *M* and *N*.

It is given that $M-N=N-M$. The statement is **sometimes true** when the matrices *M* and *N* are zero matrices.

It is given that $5M=M$. The statement is **sometimes true** when the matrix *M* zero matrix.

It is given that $M+N=M$. The statement is **sometimes true** when the matrix *N* is a zero matrix.

It is given that $5M=N$. The statement is **sometimes true** when the matrices *M* and *N* are zero matrices.

Answer 50PA.

Consider a table of data for the highest marks in Physics and Mathematics for 3 classes VIII, IX and X as follows:

Subject\Classes	Class VIII	Class IX	Class X
Physics	90	92	95
Mathematics	95	93	98

Therefore the matrix can be written as follows:

$A = \begin{bmatrix} 90 & 92 & 95 \\ 95 & 93 & 98 \end{bmatrix}$ here the rows of the matrix represent the highest marks in physics in the classes VIII, IX and X and highest marks in mathematics in the classes VIII, IX and X and the columns of the matrix represent the highest marks in Physics and Mathematics for classes VIII, XI and X.

Answer 51PA.

Consider the matrix:

$$\begin{bmatrix} 3 & 4 & 5 \\ -6 & -1 & 8 \end{bmatrix}$$

To choose the correct option follows the steps:

For option (A)

$$\begin{bmatrix} -1 & 8 & 3 \\ -4 & 0 & 5 \end{bmatrix} + \begin{bmatrix} 4 & -4 & 2 \\ 2 & -1 & -2 \end{bmatrix} = \begin{bmatrix} 3 & 4 & 5 \\ -2 & -1 & 3 \end{bmatrix}$$

For option (B)

$$\begin{bmatrix} 7 & -1 & 2 \\ 3 & 4 & -5 \end{bmatrix} + \begin{bmatrix} -4 & -3 & 3 \\ -3 & -5 & -3 \end{bmatrix} = \begin{bmatrix} 3 & -4 & 5 \\ 0 & -1 & -8 \end{bmatrix}$$

For option (C)

$$\begin{bmatrix} 1 & -3 & 5 \\ 7 & -2 & 0 \end{bmatrix} + \begin{bmatrix} 2 & 7 & 0 \\ -13 & 1 & 8 \end{bmatrix} = \begin{bmatrix} 3 & 4 & 5 \\ -6 & -1 & 8 \end{bmatrix}$$

For option (D)

$$\begin{bmatrix} 5 & 9 & -2 \\ 3 & 7 & 5 \end{bmatrix} + \begin{bmatrix} -2 & -5 & -3 \\ 3 & -8 & 3 \end{bmatrix} = \begin{bmatrix} 3 & 4 & -5 \\ 6 & -1 & 8 \end{bmatrix}$$

Therefore the correct option is: $\boxed{(C)}$

Answer 52PA.

It is given that *M* and *N* are two 2 by 2 matrices and $M + N = M$.

It will happen if and only if the matrix *N* is a zero matrix.

Therefore

$$N = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$$

Thus the correct option is: $\boxed{\text{(B)}}$

Answer 53PA.

Consider the matrices:

$$A = \begin{bmatrix} 7.9 & 5.4 & -6.8 \\ -5.9 & 4.4 & -7.7 \end{bmatrix}, B = \begin{bmatrix} -7.2 & -5.8 & 9.1 \\ 4.3 & -8.4 & 5.3 \end{bmatrix}, C = \begin{bmatrix} 9.8 & -1.2 & 5.2 \\ -7.8 & 5.1 & -9.0 \end{bmatrix}$$

First enter the three matrices by using the following commands:

[2nd][7][A][ENTER]

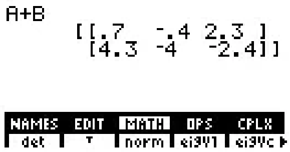
To denote the dimension press [2] and [3] and then enter the values as follows:

For matrix A:

[7.9][ENTER][5.4][ENTER][-6.8][ENTER][-5.9][ENTER] etc.

Similarly enter the other two matrices B and C also.

Now the value of $A + B$ using graphing calculator will be:



Answer 54PA.

Consider the matrices:

$$A = \begin{bmatrix} 7.9 & 5.4 & -6.8 \\ -5.9 & 4.4 & -7.7 \end{bmatrix}, B = \begin{bmatrix} -7.2 & -5.8 & 9.1 \\ 4.3 & -8.4 & 5.3 \end{bmatrix}, C = \begin{bmatrix} 9.8 & -1.2 & 5.2 \\ -7.8 & 5.1 & -9.0 \end{bmatrix}$$

First enter the three matrices by using the following commands:

[2nd][7][A][ENTER]

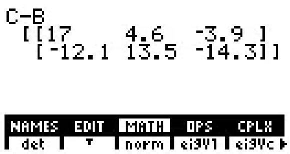
To denote the dimension press [2] and [3] and then enter the values as follows:

For matrix A:

[7.9][ENTER][5.4][ENTER][-6.8][ENTER][-5.9][ENTER] etc.

Similarly enter the other two matrices B and C also.

Now the value of $C - B$ using graphing calculator will be:



Answer 55PA.

Consider the matrices:

$$A=\begin{bmatrix}7.9 & 5.4 & -6.8\\ -5.9 & 4.4 & -7.7\end{bmatrix}, B=\begin{bmatrix}-7.2 & -5.8 & 9.1\\ 4.3 & -8.4 & 5.3\end{bmatrix}, C=\begin{bmatrix}9.8 & -1.2 & 5.2\\ -7.8 & 5.1 & -9.0\end{bmatrix}$$

First enter the three matrices by using the following commands:

[2nd][7][A][ENTER]

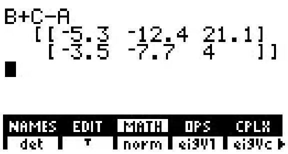
To denote the dimension press [2] and [3] and then enter the values as follows:

For matrix A:

[7.9][ENTER][5.4][ENTER][-6.8][ENTER][-5.9][ENTER] etc.

Similarly enter the other two matrices B and C also.

Now the value of $B+C-A$ using graphing calculator will be:



Answer 56PA.

Consider the matrices:

$$A=\begin{bmatrix}7.9 & 5.4 & -6.8\\ -5.9 & 4.4 & -7.7\end{bmatrix}, B=\begin{bmatrix}-7.2 & -5.8 & 9.1\\ 4.3 & -8.4 & 5.3\end{bmatrix}, C=\begin{bmatrix}9.8 & -1.2 & 5.2\\ -7.8 & 5.1 & -9.0\end{bmatrix}$$

First enter the three matrices by using the following commands:

[2nd][7][A][ENTER]

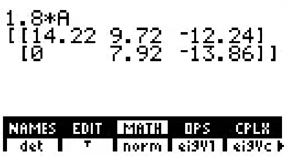
To denote the dimension press [2] and [3] and then enter the values as follows:

For matrix A:

[7.9][ENTER][5.4][ENTER][-6.8][ENTER][-5.9][ENTER] etc.

Similarly enter the other two matrices B and C also.

Now the value of $1.8A$ using graphing calculator will be:



Answer 57PA.

Consider the matrices:

$$A=\begin{bmatrix}7.9 & 5.4 & -6.8\\ -5.9 & 4.4 & -7.7\end{bmatrix}, B=\begin{bmatrix}-7.2 & -5.8 & 9.1\\ 4.3 & -8.4 & 5.3\end{bmatrix}, C=\begin{bmatrix}9.8 & -1.2 & 5.2\\ -7.8 & 5.1 & -9.0\end{bmatrix}$$

First enter the three matrices by using the following commands:

[2nd][7][A][ENTER]

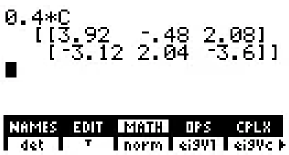
To denote the dimension press [2] and [3] and then enter the values as follows:

For matrix A:

[7.9][ENTER][5.4][ENTER][-6.8][ENTER][-5.9][ENTER] etc.

Similarly enter the other two matrices B and C also.

Now the value of $0.4C$ using graphing calculator will be:



Answer 58PA.

It is given that the quality of the calendar printed at a local shop, the last 10 calendars printed each day are examined.

Therefore the sample can be written as:

A sample of 10 calendars is examined that printed each day in the local shop to determine the quality.

Answer 59PA.

Since the sample is not a random sample, therefore it is a biased sample. The sample is a convenience one because the member of the population is easily accessed.

Answer 60MYS.

Consider the equation:

$$\frac{-4}{a+1}+\frac{3}{a}=1$$

To solve the equation follows the steps:

$$\frac{-4}{a+1}+\frac{3}{a}=1$$

$$\left(\frac{-4}{a+1}+\frac{3}{a}\right)a(a+1)=a(a+1) \qquad \text{Multiply both sides by } a(a+1)$$

$$-4a+3(a+1)=a^2+a$$

$$-4a+3a+3=a^2+a$$

$$a^2+a+a-3=0 \qquad \text{Isolating the variables}$$

$$a^2+3a-a-3=0$$

$$(a+3)(a-1)=0$$

$$a=-3,1$$

Thus the solutions are: $\boxed{a=-3,1}$.

Answer 61MYS.

Consider the equation:

$$\frac{3}{x}+\frac{4x}{x-3}=4$$

To solve the equation follows the steps:

$$\frac{3}{x}+\frac{4x}{x-3}=4$$

$$\left(\frac{3}{x}+\frac{4x}{x-3}\right)x(x-3)=4x(x-3) \qquad \text{Multiply both sides by } a(a+1)$$

$$3(x-3)+4x(x)=4x^2-12x$$

$$3x-9+4x^2=4x^2-12x$$

$$4x^2+3x-9-4x^2+12x=0 \qquad \text{Isolating the variables}$$

$$15x-9=0$$

$$5x-3=0$$

$$x=\frac{3}{5}$$

Thus the solutions are: $\boxed{x=\frac{3}{5}}$.

Answer 62MYS.

Consider the equation:

$$\frac{d+3}{d+5}+\frac{2}{d-9}=\frac{5}{2d+10}$$

To solve the equation follows the steps:

$$\begin{aligned}
\frac{d+3}{d+5}+\frac{2}{d-9}&=\frac{5}{2d+10}\\
\left(\frac{d+3}{d+5}+\frac{2}{d-9}\right)(d+5)(d-9)&=\frac{5}{2d+10}(d+5)(d-9)\\
(d+3)(d-9)+2(d+5)&=\frac{5}{2}(d-9)\\
2d^2-12d-54+4d+20&=5d-45\\
2d^2-8d-34-5d+45&=0\\
2d^2-13d+11&=0\\
(2d-1)(d-11)&=0\\
d&=\frac{1}{2},11
\end{aligned}$$

Thus the solutions are: $\boxed{d=\frac{1}{2},11}$.

Answer 64MYS.

Consider the data for the geometric sequence:

$$a_1=-2, n=3, r=7$$

Now the *n* term of a geometric series with first term *a* and common ratio *r* is given as:

$$T_n=ar^{n-1}$$

Therefore the required term of the series will be:

$$\begin{aligned}
T_3&=-2(7)^{3-1}\\
&=-2\times 7^2\\
&=\boxed{-98}
\end{aligned}$$

Answer 65MYS.

Consider the data for the geometric sequence:

$$a_1 = 4, n = 5, r = -2$$

Now the *n* term of a geometric series with first term *a* and common ratio *r* is given as:

$$T_n = ar^{n-1}$$

Therefore the required term of the series will be:

$$\begin{aligned} T_5 &= 4(-2)^{5-1} \\ &= 4 \times (-2)^4 \\ &= \boxed{64} \end{aligned}$$

Answer 66MYS.

Consider the expression:

$$b^2 + 7b + 12$$

To factorize the expression follows the steps:

$$\begin{aligned} b^2 + 7b + 12 &= b^2 + 3b + 4b + 12 \\ &= b(b+3) + 4(b+3) \\ &= \boxed{(b+3)(b+4)} \end{aligned}$$

Answer 67MYS.

Consider the expression:

$$a^2 + 2ab - 3b^2$$

To factorize the expression follows the steps:

$$\begin{aligned} a^2 + 2ab - 3b^2 &= a^2 + 3ab - ab - 3b^2 \\ &= a(a+3b) - b(a+3b) \\ &= \boxed{(a+3b)(a-b)} \end{aligned}$$

Answer 68MYS.

Consider the expression:

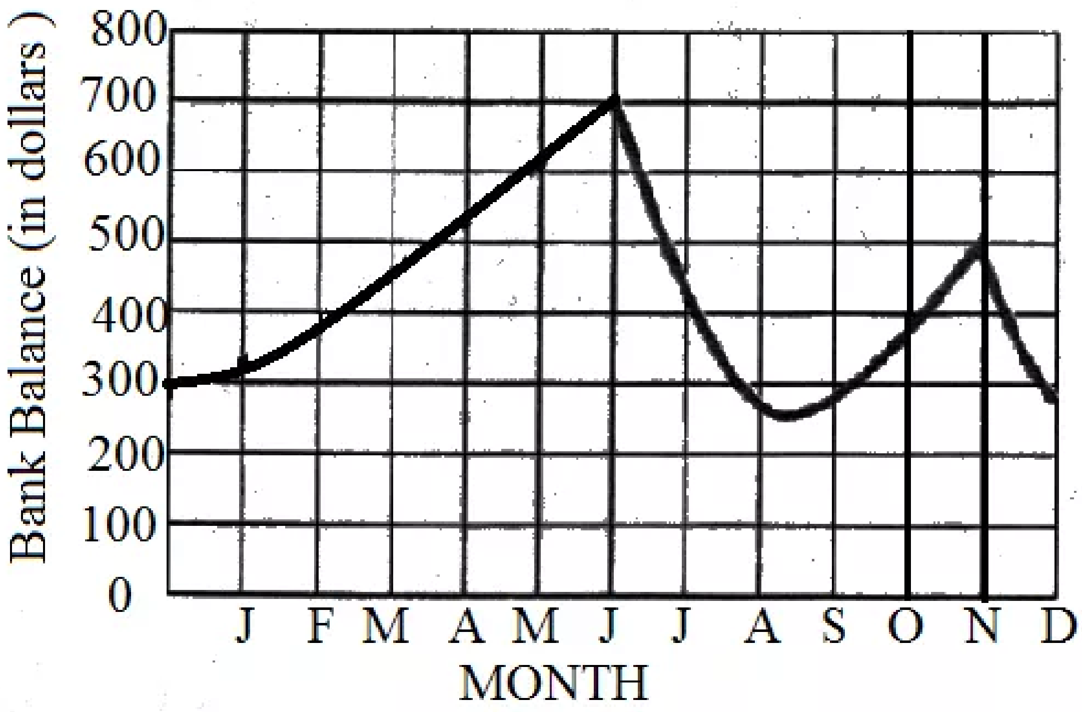
$$d^2 + 8d - 15$$

To factorize the expression follows the steps:

Here $d^2 + 8d - 15$ is a prime factor. So it can be factorized further.

Answer 69MYS.

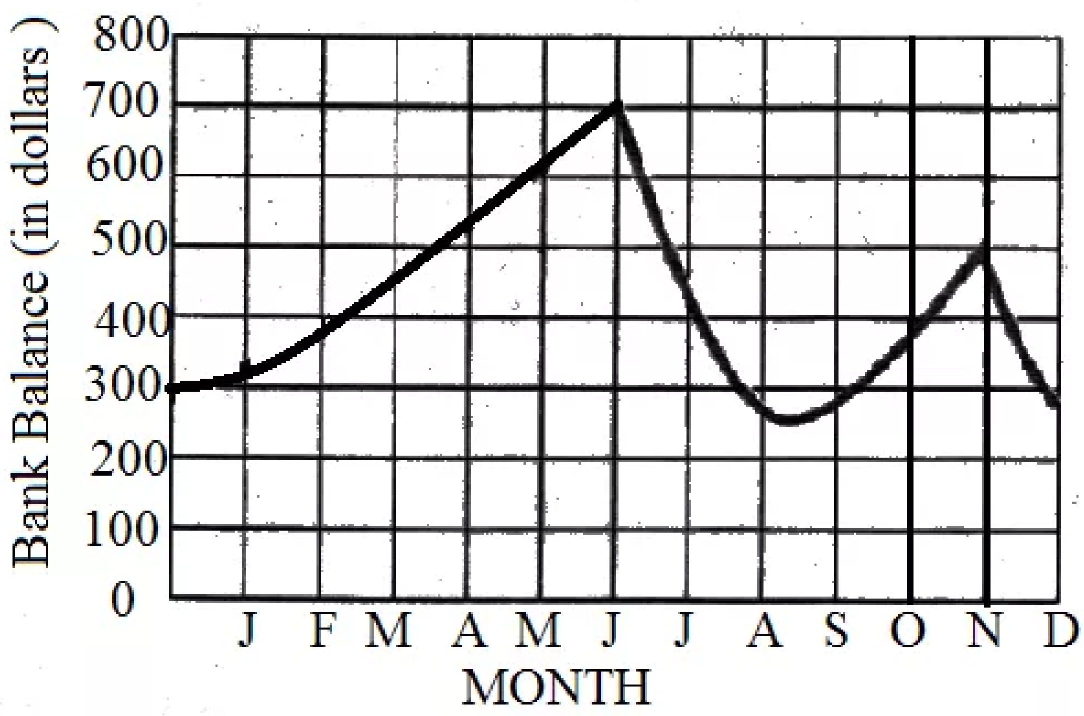
Consider the graph:



In the beginning the bank balance of Megan increases up to June. After that it decreases due to the withdrawal of amount. Than after August it again started to increase till November due to the deposit in his account. After that it again started to decrease.

Answer 70MYS.

Consider the graph:



From the graph it can be written that the domain of the graph is:

$$\boxed{D = \{0,1,2,3,4,5,6,7,8,9,10,11,12\}}$$

Here 0 indicates the balance before the starting of the year which is 300 and 1, 2 ,...., 12 are the month from January to December

The minimum balance in Megan's bank account is $250 and highest value is $700.

Therefore the range of the function is:

$$R = \boxed{[\$250, \$700]}$$