

Non-calculator

Addition and Subtraction

Simplify. Write "undefined" for expressions that are undefined.

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

$$2) \begin{bmatrix} 3 & -3 \\ 6 & 6 \end{bmatrix} + \begin{bmatrix} -5 & 5 \\ 5 & 5 \end{bmatrix}$$

$$3) \begin{bmatrix} 3 & 2 & -2 \\ -5 & 3 & 5 \end{bmatrix} + \begin{bmatrix} 5 & 5 & -4 \\ 5 & 2 & 4 \end{bmatrix}$$

$$4) \begin{bmatrix} -3 \\ -5 \\ 2 \\ 2 \end{bmatrix} - \begin{bmatrix} 2 \\ -3 \\ 3 \\ -4 \end{bmatrix}$$

$$5) \begin{bmatrix} -1 & 0 \\ 4 & 2 \\ 2 & -6 \end{bmatrix} - \begin{bmatrix} 4 \\ -6 \\ 3 \end{bmatrix}$$

$$6) \begin{bmatrix} -6 & 4 & 4 \\ -6 & -5 & 5 \end{bmatrix} - \begin{bmatrix} -6 & 4 & -4 \\ 4 & -4 & -4 \end{bmatrix}$$

Matrix Equations

$$7) \begin{bmatrix} 3x & -2 \\ -1 & 8 \end{bmatrix} + \begin{bmatrix} -4 & 0 \\ -7 & -8 \end{bmatrix} = \begin{bmatrix} -16 & -2 \\ y & 0 \end{bmatrix}$$

$$8) \begin{bmatrix} -9 & -3 & -11 \end{bmatrix} - 5B = \begin{bmatrix} 16 & 42 & -1 \end{bmatrix}$$

$$9) \begin{bmatrix} 0 & 8 \\ 6 & 10 \end{bmatrix} + 2Z = \begin{bmatrix} 6 & 28 \\ -8 & 8 \end{bmatrix}$$

Multiplication

$$9) -\frac{1}{2} \begin{bmatrix} -1 \\ -1 \\ -2 \end{bmatrix}$$

$$10) 5 \begin{bmatrix} -1 & -6 & -1 \\ 6 & -2 & 2 \end{bmatrix}$$

$$11) \begin{bmatrix} 5 & 3 \\ -4 & -4 \\ 1 & 0 \end{bmatrix} \cdot \begin{bmatrix} -1 \\ -6 \end{bmatrix}$$

$$12) \begin{bmatrix} -1 & 0 \\ -1 & 6 \end{bmatrix} \cdot \begin{bmatrix} -4 & 5 \\ -3 & -3 \end{bmatrix}$$

$$13) \begin{bmatrix} 6 & -2 & -4 \\ -2 & -5 & -1 \end{bmatrix} \cdot \begin{bmatrix} 5 & -2 & -1 \\ -1 & -5 & -2 \end{bmatrix}$$

Calculator Portion

Systems

Write a matrix equation for the system.

$$\begin{aligned} 14) \quad & -8x - 15y = 29 \\ & 10x + 5y = 5 \end{aligned}$$

Write a matrix equation for each system and then solve.

$$\begin{aligned} 15) \quad & 6x - 5y = -5 \\ & 12x + y = 1 \end{aligned}$$


$$\begin{aligned} 16) \quad & a - 3b + 4c = -11 \\ & 6a - 3b + c = 19 \\ & 5a + 6b - 4c = 23 \end{aligned}$$

17) The sum of the digits of a certain two-digit number is 3. When you reverse its digits you decrease the number by 9. What is the number?

18) When you reverse the digits in a certain two-digit number you increase its value by 27. What is the number if the sum of its digits is 11?

Word Problems

| Sport | Males | | Females | |
|---------------------|---------|--------------|---------|--------------|
| | Schools | Participants | Schools | Participants |
| Basketball | 16,763 | 549,499 | 16,439 | 456,873 |
| Track and Field | 14,620 | 477,960 | 14,545 | 405,163 |
| Baseball/Softball | 14,486 | 455,305 | 12,679 | 340,480 |
| Soccer | 9041 | 321,416 | 7931 | 257,586 |
| Swimming and Diving | 5234 | 83,411 | 5450 | 133,235 |



Source: National Federation of State High School Associations

- 19) Write two matrices that represent these data for males and females.
- 20) Find the total number of students that participate in each individual sport expressed as a matrix.

The Westfall Youth Baseball and Softball League charges the following registration fees: ages 7–8, \$45; ages 9–10, \$55; and ages 11–14, \$65.

- 21) Write a matrix for the registration fees and a matrix for the number of players.
- 22) Find the total amount of money the League received from baseball and softball registrations.

| Team Members | | |
|--------------|----------|----------|
| Age | Baseball | Softball |
| 7–8 | 350 | 280 |
| 9–10 | 320 | 165 |
| 11–14 | 180 | 120 |