

1. Solve the system

$$\begin{aligned}x^2 + 4y - x &= 8 \\x + y &= 3.\end{aligned}$$

Check your work by substituting your answer in the original system.

2. At a grocery store, mozzarella cheese is sold in half pound blocks for \$2 each. One pound blocks of cheddar cheese cost \$3 each. If a shopper spent \$13 on cheddar and mozzarella cheese to buy 4 pounds of cheese, how many blocks of cheddar and mozzarella cheese were purchased?

3. Solve the system

$$\begin{aligned}x + 2y - z &= 10 \\2y + z &= 2 \\2x + 5y - 5z &= 28.\end{aligned}$$

Check your work by substitution.

4. Rewrite the given matrix as a system of equations with variables x, y, z and w .

$$\left[\begin{array}{cccc|c} 1 & 5 & -2 & 3 & 4 \\ 3 & 2 & 5 & 1 & 11 \\ 0 & 6 & 11 & -1 & 2 \\ 7 & 2 & 2 & 0 & -1 \end{array} \right]$$

- 5.

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

Compute AB and BA .

6. Find the inverse of

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

Verify your answer by computing A times A^{-1} .

7. Simplify

$$3 \begin{bmatrix} 2 & 3 \\ 1 & -2 \end{bmatrix} - \begin{bmatrix} 1 & 0 \\ -1 & 2 \end{bmatrix}.$$

8. Compute the determinant of

$$\begin{bmatrix} 3 & 0 & -1 \\ 1 & 5 & 2 \\ 0 & 1 & 1 \end{bmatrix}.$$

9. Compute

$$\sum_{i=1}^7 (-1)^i$$

10. For an arithmetic sequence, suppose that $a_5=13$ and $a_{11} = 37$. Compute a_{20} .

11. Simplify $\frac{11!}{8!}$.

12. Let 3, 7, 11, 15 be the first four terms of an arithmetic sequence. Write down the general formula for a_n .

13. Given an arithmetic sequence with $a_6 = 5$ and $a_{13} = 47$, find S_{20} , the sum of the first twenty terms of this sequence.

14. Compute

$$\sum_{i=1}^5 2^{i-1}$$

15. Suppose that a sequence is defined recursively as follows: $a_1 = 2$, $a_2 = -1$ and $a_{k+2} = a_k + a_{k+1}$. Write down the first five terms of this sequence.

16. Write an expression for the n th term of the sequence:

$$-\frac{2}{5}, \frac{2}{25}, -\frac{2}{125}, \frac{2}{625}, \dots$$