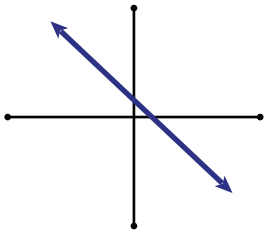
ALGEBRA APPLICATIONS

LINEAR EQUATIONS

CONCEPT Linear equations are mathematical expressions that describe a straight line on a graph. They consist of variables, coefficients, and constants, and are expressed in the form of ax + b = c, where “a” and “b” are coefficients, “x” is the variable, and “c” is a constant.



BACKGROUND

The history of linear equations dates back to ancient civilizations such as Egypt, Babylon, and China, where they were used to solve practical problems such as land measurement, taxation, and commerce. The ancient Greeks developed geometric methods for solving linear equations and were able to solve some systems of equations with two or three unknowns. During the Middle Ages, mathematicians in the Islamic world made significant contributions to algebra. In the 17th and 18th centuries, mathematicians such as Descartes and Euler developed the modern concept of coordinates, which allowed linear equations to be represented graphically. The 19th century saw the development of matrix algebra and the formalization of linear algebra as a mathematical discipline, laying the groundwork for the development of modern algebraic and computational methods for solving linear equations. Today, linear equations are used in a wide range of fields, from physics and engineering to finance and computer science.

REAL WORLD CONNECTIONS

A farmer wants to plant a certain number of acres of corn and soybeans on their farm. Let’s say that they have 100 acres of land available and want to use all of it for planting. If they decide to plant “x” acres of corn and “y” acres of soybeans, the total number of acres planted will be “x + y = 100”. This is an example of a linear equation in two variables, where “x” represents the number of acres of corn planted and “y” represents the number of acres of soybeans planted. The equation represents a constraint on the farmer’s planting decisions, as the total number of acres planted cannot exceed the available land. By solving this equation, the farmer can determine all possible combinations of corn and soybean acreage that satisfy this constraint.