

College Algebra

Section 6.1

Functions and Systems of Equations in Two Variables

The definition for a function of two variables is the same as the definition of a function of one variable except that the input (domain) consists of an ordered pair of real numbers (x, y) and the output is a single real number z .

Example: The volume, V , of a right circular cylinder having base radius r and height h is given

by the formula $V = \pi r^2 h$ which can be written as a function of two variables $V(r, h) = \pi r^2 h$

Find $V(2, 6)$ and interpret the result.

Systems of Equations in Two Variables

Linear System:

Form:

The Geometry behind a Linear System

Recognizing Types of Linear Systems

Methods of Solution

Substitution

Elimination

Examples: Solve the following linear systems. Choose your method.

(a)	$2x - 3y = 0$	(b)	$6x - 4y = 3$	(c)	$\frac{2}{3}x + \frac{4}{3}y = \frac{1}{3}$
	$3x - 2y = -5$		$-3x + 2y = -\frac{3}{2}$		$-2x - 4y = 5$

Non-Linear Systems

Example: Solve the following systems using any method

(a)	$2x - 3y = 1$	(b)	$x^2 - 3y = 3$	(c)	$2x^2 - y = -1$
	$2x^2 + y = 1$		$x^2 + 2y^2 = 5$		$-x^2 + y = -1$

Joint Variation

Definition: z varies jointly as x and y means

Example: Suppose P varies jointly as the square of x and the cube of y . If $P = 432$ when $x = 2$ and $y = 3$, find P when $x = 3$ and $y = 5$.