4.1 Systems of Equations

Chapter 4: SYSTEMS OF EQUATIONS

Section 4.1: SYSTEMS OF EQUATIONS

Objectives:
- Determine if ordered pairs are solutions of systems of equations.
- Solve systems of equations graphically.
- Solve systems of equations by substitution.
- Use systems of equations to model and solve real life problems.

\[
x + y = 3 \\
x - y = -2
\]

Vocabulary:
- system of equations
- solution
- point of intersection
- consistent
- inconsistent
- dependent
Three methods to solve a system of equations:

1. Graphing

2. Substitution

3. Elimination

EXAMPLE:
Solve each system by graphing

a) $x - y = 3$
$2x + 3y = 7$

b) $2x + y = 3$
$2y = -4x + 8$
2. Example

Solve by substitution

(a) \[ y = 2x + 1 \]
\[ 3x + 2y = 16 \]

(b) \[ x + y = 3 \]
\[ 2y = 2x + 6 \]

(c) \[ 2x + 5y = 15 \]
\[ y = -\frac{2}{5}x \]

(a) \[ x - y = 5 \]
\[ 2x = 2y + 10 \]

(b) \[ y = -\frac{3}{2}x + 4 \]
\[ 3x + 2y = 3 \]
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EXAMPLE:
Set up a set of equations and solve these problems.

a) The sum of two numbers is 160.
The larger number is three times the smaller number.
Find the two numbers.

b) The perimeter of a rectangle is 90 meters.
The length is 1\(\frac{1}{2}\) times the width.
Find the dimensions of the rectangle.

c) Ten pounds of a nut mixture sells for $6.95 per pound.
The mixture is made from two kinds of nuts; peanuts at $5.65 per pound and cashews at $8.95 per pound.

How many pounds of each will be used in the mixture?