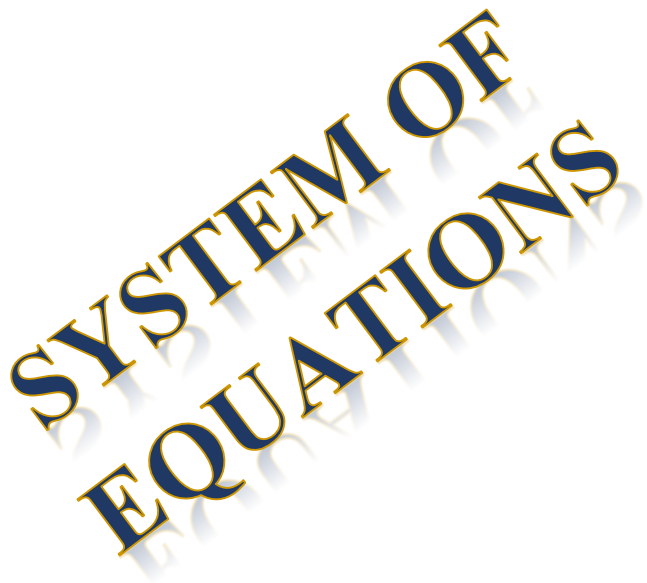
FOUNDATIONS & PRE-CALCULUS 10

Seminar Notes

Learning Guides 15 & 16



Frances Kelsey Secondary School – 2019/20

Topic 1 Developing Systems of Linear Equations

Example 1 Using a Diagram to Model a Situation

a) Create a linear system to model this situation:
The perimeter of a Nunavut flag is 16 ft.
Its length is 2 ft. longer than its width.

b) Denise has determined that the Nunavut flag is 5 ft. long and 3 ft. wide.
Use the linear system from part a to verify that Denise is correct.

CHECK YOUR UNDERSTANDING

Try: **a)** Create a linear system to model this situation:
The stage at the Lyle Victor Albert Centre in Bonnyville, Alberta, is rectangular.
Its perimeter is 158 ft.
The width of the stage is 31 ft. less than the length.

b) Sebi has determined that the stage is 55 ft. long and 24 ft. wide. Use the linear system from part a to verify that Sebi is correct.

Example 2 Using a Table to Create a Linear System to Model a Situation

a) Create a linear system to model this situation:
In Calgary, a school raised $195 by collecting 3000 items for recycling.
The school received 5¢ for each pop can and 20¢ for each large plastic bottle.

b) The school collected 2700 pop cans and 300 plastic bottles.
Use the linear system to verify these numbers.

CHECK YOUR UNDERSTANDING

Try: **a)** Create a linear system to model this situation:
A school raised $140 by collecting 2000 cans and glass bottles for recycling.
The school received 5¢ for a can and 10¢ for a bottle.

b) The school collected 1200 cans and 800 bottles.
Use the linear system to verify these numbers.

Topic 2 Solving a System of Linear Equations Graphically

Example 1 Solving a Linear System by Graphing

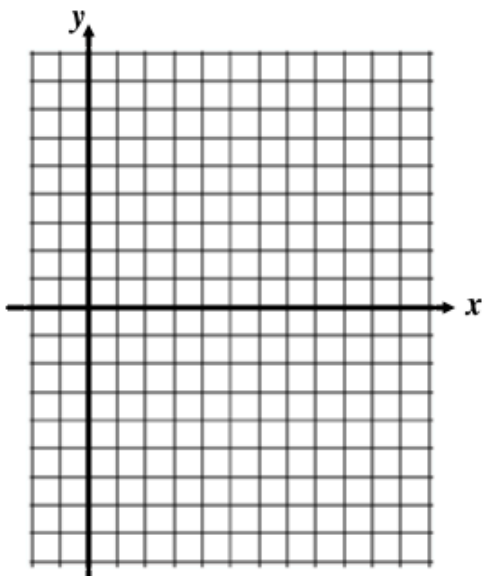
Solve this linear system.

$x + y = 8$

$3x - 2y = 14$

1st Step: Get into Slope-Intercept Form > $y = mx + b$

2nd Step: Then Graph using m & b

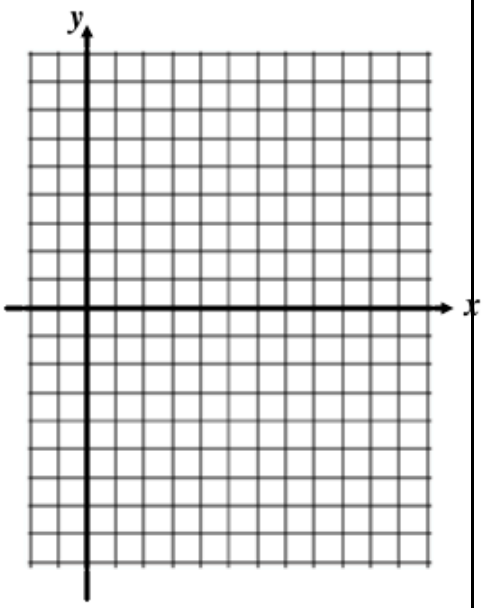


CHECK YOUR UNDERSTANDING

Try: Solve this linear system.

$2x + 3y = 3$

$x - y = 4$



Example 3 Solving a Problem by Writing then Graphing a Linear System

a) Write a linear system to model this situation:
To visit the Head-Smashed-In Buffalo Jump interpretive centre near Fort Macleod, Alberta, the admission fee is $5 for a student and $9 for an adult. In one hour, 32 people entered the centre and a total of $180 in admission fees was collected.

b) Graph the linear system then solve this problem: How many students and how many adults visited the centre during this time?

LEARNING GUIDE 16

Topic 3 Using a Substitution Strategy to Solve a System of Linear Equations

Example 1 Solving a Linear System by Substitution

Solve this linear system.

$2x - 4y = 7$

$4x + y = 5$

CHECK YOUR UNDERSTANDING

Try: Solve this linear system.

$5x - 3y = 18$

$4x - 6y = 18$

Example 2 Using a Linear System to Solve a Problem

a) Create a linear system to model this situation:
Nuri invested $2000, part at an annual interest rate of 8% and the rest at an annual interest rate of 10%. After one year, the total interest was $190.

b) Solve this problem: How much money did Nuri invest at each rate?

Topic 4 Using an Elimination Strategy to Solve a System of Linear Equations

Example 1 Solving a Linear System by Subtracting to Eliminate a Variable

Solve this linear system by elimination.

$3x - 4y = 7$

$5x - 6y = 8$

CHECK YOUR UNDERSTANDING

Try: Solve this linear system by elimination.

$2x + 7y = 24$

$3x - 2y = -4$

Example 2 Solving a Linear System by Adding to Eliminate a Variable

Use an elimination strategy to solve this linear system.

$\frac{2}{3}x - \frac{1}{2}y = 4$

$\frac{1}{2}x + \frac{1}{4}y = \frac{5}{2}$

CHECK YOUR UNDERSTANDING

Try: Use an elimination strategy to solve this linear system.

$\frac{3}{4}x - y = 2$

$\frac{1}{8}x + \frac{1}{4}y = 2$

Example 3 Using a Linear System to Solve a Problem

a) Write a linear system to model this situation:
An alloy is a mixture of metals. An artist was commissioned to make a 100-g bracelet with a 50% silver alloy. He has a 60% silver alloy and a 35% silver alloy.

b) Solve this problem:
What is the mass of each alloy needed to produce the desired alloy?

CHECK YOUR UNDERSTANDING

Try: **a)** Write a linear system to model this situation:
An artist was commissioned to make a 625-g statue of a raven with a 40% silver alloy. She has a 50% silver alloy and a 25% silver alloy.

b) Solve this problem: What is the mass of each alloy needed to produce the desired alloy?