Lesson 7.1 – Developing Systems of Linear Equations

Specific Outcome: 9.1 – Model a situation, using a system of linear equations. 9.2 – Relate a system of linear equations to the context of a problem.

SYSTEM OF EQUATIONS:

***LINEAR* SYSTEM OF EQUATIONS:**

***SOLUTION*:**

*****In order to *solve* a system of linear equations, we must be able to *develop 2 equations first,* and then solve the system. In this lesson we will only be learning to develop 2 equations (a system) from a problem.

Consider: A school district has buses that carry 12 passengers and buses that carry 24 passengers. The total passenger capacity is 780. There 20 more small buses than large buses. How many of each bus is there?

1. Identify the 2 unknown quantities:

2. Develop 2 equations using both variables:

3. Verify the system: The solution is 35 small buses and 15 large buses. Use these numbers in the equations developed to check your work.

Practice:

1a) 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. Determine the length and width.

b) Denise has determined the flag is 5 ft. long and 3 ft. wide. Verify that Denise is correct.

2a) Create a linear system to model this situation:
The stage at the Lyle Victor Albert Centre in Bonnyville, AB is rectangular. Its perimeter is 158 ft. The width of the stage is 31 ft. less than the length. Determine the dimensions.

b) Sebi has determined that the stage is 55 ft. long and 24 ft. wide. Verify that Sebi is correct.

3a) Create a linear system to model this situation:
In Calgary, a school raised $195 by collecting 3000 items for recycling. The school received 5 cents for each pop can and 20 cents for each plastic bottle. How many of each were collected?

b) The school collected 2700 pop cans and 300 plastic bottles. Verify this solution.

4a) 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 cents for a can and 10 cents for a bottle. How many of each were collected?

b) Verify that the school collected 1200 cans and 800 bottles.

5. Create a linear system to model the following situations:

a) The difference between two numbers is 16. Five times the smaller is the same as 8 less than twice the larger. Determine the two numbers.

b) The difference between two numbers is 9. The larger number is 3 more than twice the smaller number. Determine the two numbers.

c) The sum of two numbers is 13. Two times the larger is the same as 4 less than four times the smaller. Determine the two numbers.

*d) A number consists of two digits whose sum is 11. If the digits are reversed, the original number is increased by 27. Determine the two numbers.

HOMEWORK: P. 400 – 2, 5-8, 11-13