- 9.2 Solving System of Equations by Elimination
- 9. Solve problems that involve systems of linear equations in two variables, graphically and algebraically.

Jan 3-7:54 AM

# 9.2 Solving Systems of Linear Equations by Elimination

You can solve a system of linear equations using the **elimination method**. To do this, a variable in both equations must have the same or opposite coefficient. It is often necessary to multiply one or both equations by a constant.

For example, solve the following linear system:

$$6a + 5b = 24$$

$$4a + 3b = 12$$

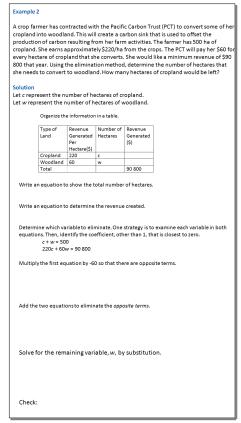
In order to eliminate variable a, you need to multiply the first equation by -2. Multiply the second equation by 3. Now, when we add the terms together the variable a will be eliminated (-12a+12a=0).

# Example 1 Solve a System of Linear Equations by Elimination Connor downloaded two orders of games and songs. The first order consisted of five games and four songs for \$26. The second order consisted of three games and two songs for \$15. All games cost the same amount, and all songs cost the same amount. Write a system of linear equations. Then, determine the cost of one song and the cost of one game. Solution

Jun 3-8:17 AM

### **Your Turn**

A group of people bought tickets for a University of Alberta basketball playoff game. Two student tickets and six adult tickets cost \$102. Eight student tickets and three adult tickets cost \$114. What was the price for a single adult ticket? What was the price for a single student ticket?



Jun 3-8:21 AM

### **Your Turn**

During lunch, the cafeteria sold a total of 160 muffins and individual yogurts. The price of each muffin is \$1.50. Each container of yogurt is \$2.00. The cafeteria collected \$273.50. Set up and solve a linear system in order to determine the number of muffins and the number of yogurts sold.

## Example 3

The perimeter of a rectangular garden is 17.00 m. Triple the length is 2.46 m longer than five times the width. Sketch and label a diagram. Create a system of linear equations to determine the dimensions of the rectangle. Solve the system using elimination.

Solution

Jun 3-8:25 AM

# Your Turn

A rectangular parking pad for a car has a perimeter of 12.2 m. The width is 0.7 m shorter than the length. Use a linear system to determine the dimensions of the pad.