**Activity 1.1.9 Natasha’s Cat**

**The Seven Steps for Solving a Linear Programing Problem**

1. Define variables for unknowns in the problem
2. Used defined variables to write constraints for the problem
3. Graph the system of inequalities to obtain the feasible region
4. On the graph, determine and label the corner points of the feasible region
5. Define the objective function
6. Evaluate the objective function at all corner points
7. Check that the solution makes sense in terms of the original problem and include appropriate units

Use the linear programming procedure to solve the problem below.

Natasha’s cat, Dancer, will eat both dry food and wet (canned) food. Natasha wants Dancer to eat meals that are nutritious, but would also like to save some money on her cat’s food bill. Dancer usually eats wet food. However, the wet food is more expensive. In order to save money, Natasha is trying to decide if she can switch her cat to a diet with some wet and some dry food, or perhaps all dry food. However, she wants to ensure that the new diet satisfies Dancer’s nutritional requirements.

Protein and fat are two important components of a cat’s diet. Proteins serve as building blocks for bones and muscles, while fat provides energy and helps with the absorption of vitamins. Dancer needs at least 60 grams of protein per day and at least 12 grams of fat per day. The wet food provides about 12 grams of protein per serving while the dry food provides about 24 grams of protein per serving. The wet food contains about 6 grams of fat while dry food contain about 4 grams of fat per serving. The wet food costs 80 cents per serving and the dry food costs 66 cents per serving. How many servings of wet and dry food will Dancer need each day to meet her nutritional requirements while keeping Natasha’s pet food bill a minimum?