1. Formulate the following scenario as a system of inequalities using the given definitions of \( x_1 \), \( x_2 \), and \( x_3 \):

Darrin is trying to lose weight and wants to limit his intake to 2,000 calories per day. Each gram of fat contributes 9 calories and each gram of protein or carbohydrates contributes 4 calories. The recommended amount of fat is no more than 65 grams per day. In addition, he is trying a "low-carb" diet and so he wants to eat at least as many grams of protein as grams of carbohydrates.

Let \( x_1 \) be the number of grams of fat, \( x_2 \) be the number of grams of protein, and \( x_3 \) be the number of grams of carbohydrates in his diet.

\[
\begin{align*}
9x_1 + 4x_2 + 4x_3 & \leq 2000 \\
x_1 & \leq 65 \\
x_2 & \geq x_3 \\
x_1 \geq 0, x_2 \geq 0, x_3 \geq 0
\end{align*}
\]

2. For the following system of inequalities:

\[
\begin{align*}
3x - y & \leq 3 \\
3y - x & \leq 3 \\
y & \geq 0
\end{align*}
\]

- Draw a graph of the system and shade in the feasible region.
- On the graph, label each of the boundary lines with its equation.
- On the graph, label each of the vertices with its coordinates.
- State whether the feasible region is "bounded" or "unbounded."

(The feasible region is bounded and it is the part in white.)