Inequality Exploration Questions

1. Sketch the graphs of the following inequalities:
   - $2x + 1y < 3$
   - $2x + 1y \leq 1$

   Change the window so that you are looking at the graph close up (HINT: try a scale of 0.25 for both the x and the y axis). What do you notice is different between these two inequalities on the graph? Why are these things different? What do you notice is similar between these two inequalities on the graph? Why are these things similar?

2. Graph the following inequality: $4x + 2y \geq 7$. Using the graph, name three data points that would satisfy this inequality. Now explain why they would be part of the inequality algebraically. What are three data points that would not satisfy this inequality? Explain why they aren't part of the inequality algebraically.

3. How does graphing a linear inequality help us understand the equation? Provide an example and explain all of the information that we can gather from the graph of an inequality.

4. Graph the following inequalities: $3x + 3y < 10$ and $5x + 6y > 9$. Using the graph, name three data points that would satisfy the system $3x + 3y < 10$ and $5x + 6y > 9$. Explain why these points would be part of the system algebraically. What are three data points that would not satisfy the system? Why don't they satisfy the system?