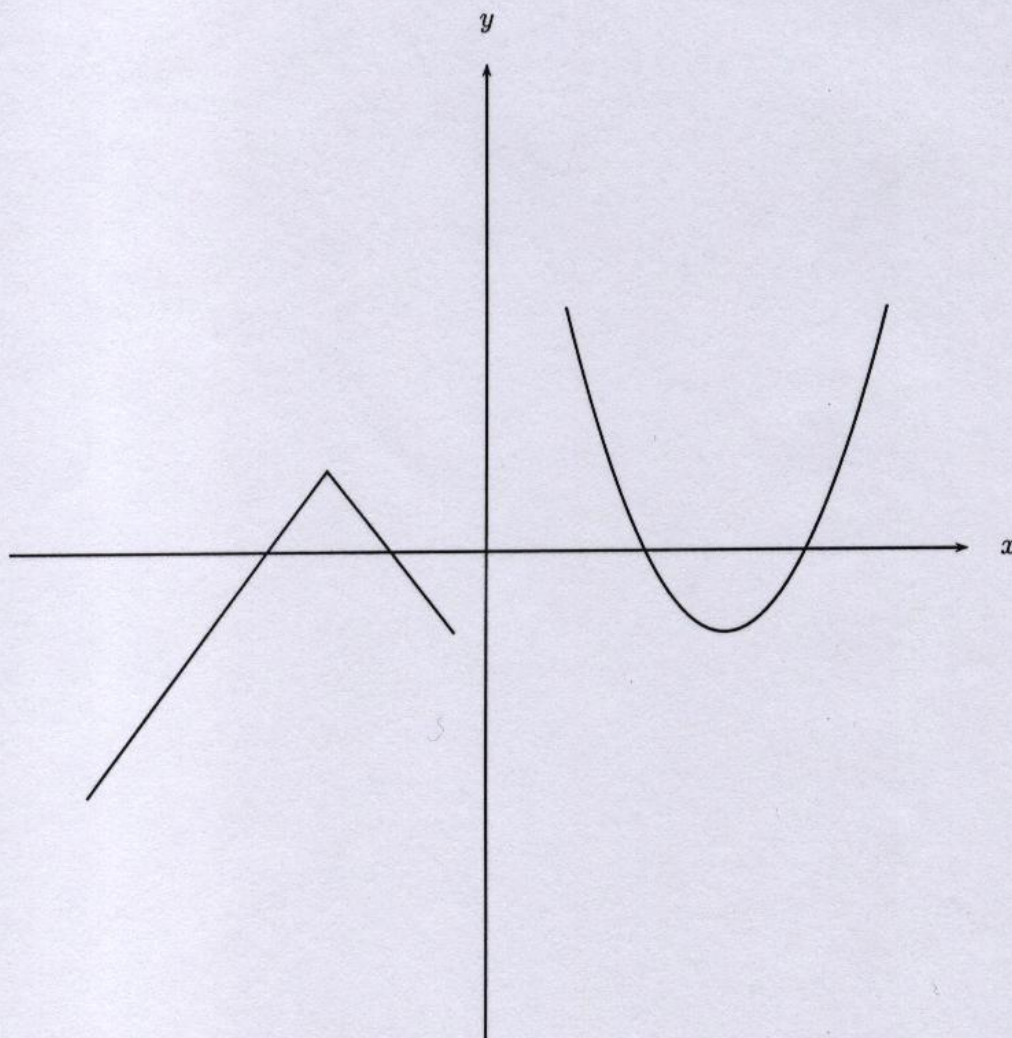


When teaching about functions, we often use terminology like the function is increasing, decreasing, concave up, concave down, and differentiable. More often than not, students avoid this vocabulary. In order to reinforce it and demonstrate the need for the vocabulary and its use, I would like to incorporate more active learning in classes I teach which involve the graphs of functions. I would propose to use the following exercise.

1. Group the students into groups of 3. One student facing the front of the room with an overhead, the second facing away from the overhead (*eyes closed*), and the third off to the side.
2. The following graph will be displayed on the overhead.



3. The student facing the overhead will describe to the student with their back to the overhead the graphs that are displayed.
4. From the description of the graph, the student facing away from the overhead with their eyes closed will attempt to sketch the graph.
5. The third student will monitor their progress, making note of the description being given along with the resultant reaction. This will facilitate a followup discussion.

We would hope the discussion would include phases describing the graph on the left as being concave down, non-differentiable with vertex in the 2nd quadrant, the graph beginning and ending in the 3rd quadrant. The graph could be described as having the same slopes in magnitude, but opposite in sign. The second graph could be described as a parabola, concave up, with its vertex in the 4th quadrant.