1. Consider a list where you know that the value of every item is within the middle third of the values that are above it. You will modify insertion sort (with a sentinel) to take advantage of this fact. In order to avoid worrying about floors and ceilings, the exact definition of “middle third” is up to you, and can be defined implicitly by your program. For the following analyses, just get the high order term right. Justify your answers.

(a) Briefly explain your modification in English.
(b) Write pseudo code for your algorithm.
(c) How many comparisons does your algorithm do in the best case?
(d) How many comparisons does your algorithm do in the worst case?
(e) How many comparisons does your algorithm do in the average case?
(f) How many moves does your algorithm do in the best case?
(g) How many moves does your algorithm do in the worst case?
(h) How many moves does your algorithm do in the average case?