The setting for this assignment is as follows. A teacher’s union negotiated a three-year contract, which provided for successive pay raises of 3%, 4%, and 5%. In other words, for the first year, each teacher’s salary would be 3% higher than the year before; for the second year, each teacher’s salary would be 4% higher than in the first year; and for the third year, each teacher’s salary would be 5% higher than in the second year.

1. What was the “total raise”? By this we mean, how much higher were salaries in the third year than in the year before the new contract? Express your answer as a percent. (This requires some nontrivial calculations. A calculator will definitely be useful.)

2. Suppose the raises had been reversed, with 5% the first year, 4% the second year, and 3% the third year. Would the total raise (see question #1 for its definition) have been different? Explain.

3. Expressed as a percentage of a teacher’s pre-contract annual salary, how much more money in total will a teacher collect over the three years of the contract than s/he would have earned if there had been no raises whatsoever? [Hint: this is not the same question as #1—think about it.]

4. Expressed as a percentage of a teacher’s pre-contract annual salary, how much more money in total would a teacher collect over the three years of the contract if the raises were reversed (5-4-3) than if the raises were in the order actually given (3-4-5)?

5. The contract was reported in the press as calling for “a raise of 12% over three years”. Is this an accurate description?

   (a) What is the best way to package “12% over three years” if we want the final salaries (i.e., in the third year) to be as high as possible?

   (b) What is the best way to package “12% over three years” if we want the total amount of money received over the three years to be as large as possible?

Note that part (a) deals with what questions #1 and #2 dealt with, and part (b) deals with what questions #3 and #4 dealt with. Don’t be limited in your exploration of these questions by considering only the 3-4-5 and 5-4-3 contracts discussed above; there are about a hundred possible ways to package it using whole percents.