Comments on the Diagnostic Problem

Most of you did the problem well.

If I wrote “try again” on your paper, you made a serious mistake. Please do the problem again. You needn’t turn your new solution in, though I’ll be happy to look at it if you wish. Since this problem is rather easy, you need to be able to do it well in order to succeed in the course. The homework problems are much harder. See me if you aren’t confident.

Some Comments:

(1) To prove something about the orders of elements, one must use the definition of order. A proof that doesn’t refer to the definition should be considered incomplete. It is best to review the definition at the start.

(2) Most of you supposed that \((ab)^n = 1\), and worked to show that then \((ba)^n = 1\). Some of your stopped there. That is good, but it shows only that the order of \(ba\) is less than or equal to the order of \(ab\).

(3) Many of you forgot to mention the case of infinite order. It should be mentioned, though it is very easy.

(4) Some of you showed that \((ab)^n = 1\) if and only if \((ba)^n = 1\), and said you were done. Though that is correct, it would be best to clarify your reasoning by reference to the definition.

Reviewing the definition at the start would help you avoid the errors (2) and (3).