GRADE SEVEN –CONTENT STANDARD #10

FORMAL ASSESSMENT A

PHONE TREES

In case of an emergency radiation leak at a nearby nuclear power plant, a community is planning to set up a phone tree. The original plan specifies that the plant superintendent calls three key community contact persons who, in turn, each call three persons, who then each call three additional persons, and the tree continues until all 10,000 households have been reached.

1. Draw a diagram and/or table showing how many rounds of calls must be made before everyone is notified.

2. If the superintendent makes the first call at 10:21 and if each call takes 1 minute, at what time will the last household be notified?

3. One member of the community is concerned that it might take too long to notify everyone and proposed a five-call tree. That is, the superintendent calls five persons and each person in turn calls five others. If, once again, each call takes 1 minute, how long would it take for the five-call-tree system to reach 10,000 households?

4. Propose a phone tree system that would notify all 50,000 households in a community in less than 15 minutes.

[Source: A Guide to K-12 Program Development in Mathematics, Connecticut State Department of Education]