d) Assume n is finite. The outer loop contains a function that terminates as well as a for loop that was shown to terminate in b). As the for loop contains elements that all terminate, we can say that the outer loop terminates if n is finite. ■ 4

e) Assume the two loop invariants are true. Thus for any b, $A[b+1] \geq A[b]$.

3) Assume that each person has 0-13 friends, ie. they cannot be friends with themselves. Also assume that if one person is friends with the other, that person is also friends with the first person.

Case one: somebody is friends with everybody, so noone is friends with nobody. As everyone has between 1 and 13 friends and there are 14 people, two people must have the same number of friends via the pigeonhole principle ■.

Case two: This is the opposite of the first, where nobody is friends with everybody, and as a result somebody is friends with nobody. Therefore, again by the pigeonhole principle there must be somebody who has the same number of friends as somebody else, since everyone has 0-13 friends and there are 14 people.

Both cases are true, so the result is true. ■