

Problems For Tour 5

First, let's talk about *Mathematical Induction*.

To prove that a statement is true for all positive integers n , it suffices to do the following:

- 1) Prove the statement for $n = 1$.
- 2) Prove that *if* the statement is true for $n = k$, *then* the statement must also be true for $n = k + 1$.

Here are some problems.

1. Prove that the sum of the interior angles of any n -gon is $180(n - 2)$ degrees.
2. On a large flat field, $2n + 1$ people are positioned so that for each person the distances to all the other people are different. Each person holds a water pistol and at a given signal fires and hits the person who is closest. Show that there is at least one person who will be left dry.
3. There are g girls and b boys playing Frogger. (Your studley tour guide will explain how this game works).
If there are exactly g girls and 1 boy (i.e. $b = 1$), how many moves are required to complete the game?