1) Prove by induction on Lists the property
\[ \forall l, m : \text{List Int.} \; \text{sum} \; (l \; ++ \; m) = \text{sum} \; l \; + \; \text{sum} \; m \]
Where sum is a function that sums all the numbers in a list.

2) Recall the definition of BTrees
\[
\text{data BTree a = Leaf a | Fork (BTree a) (BTree a)}
\]
and the Induction Hypothesis and leafCount for BTrees as defined in class.

Using the definition of flatten
\[
\text{flatten (Leaf x) = [x]}
\]
\[
\text{flatten (Fork t1 t2) = (flatten t1) ++ (flatten t2)}
\]

Prove by induction on BTrees, that
\[ \forall t : BTree \; a. \; \text{leafCount} \; t = \text{length} \; (\text{flatten} \; t) \]
Where length is the length of a list.