Hint. *For problem 1 it would be helpful to show that the union of κ-many sets of size κ has size κ.*

Hint. *For problem 2, you need to do a similar diagonalization to those that we did in class. At stage n you must have made promises which deal with the first n sets.*

Hint. *For problem 3, the diagonalization is similar. To show that $\mathfrak{t}$ is regular, suppose that it is singular and then break the tower in to smaller chunks.*

Hint. *For problem 4, it is enough to make an almost disjoint family of* some *countable set. Such a family can easily be copied to one on ω.*