Sep 3: Week 1 Problems

Problem 1 (Putnam 2002)

Suppose 5 points are placed on the surface of a sphere. Show that there is some hemisphere that contains 4 points on it (including the boundary).

Problem 2 (Putnam 2010)

Does there exist an infinite sequence of real numbers $a_1, a_2, a_3 \ldots$ such that

$$a_1^n + a_2^n + a_3^n + \cdots = n$$

for every positive integer n.