Math 2001: PHW4

1. From the book do:

   - 2.6: 10
   - 2.7: 2, 8, 10
   - 2.10: 2, 4, 6, 8, 10

2. A point (m, n) in $\mathbb{R}^2$ is a *lattice point* if both $m, n \in \mathbb{Z}$. Prove that the number of lattice points inside any circle centered at the origin is a number of the form $4k + 1$ for some integer k (note that you don't have to say what k is).

   Hint: Split the set of lattice points into subsets, depending on the quadrants.