Practice Problem Set 2

(1) For the following problems, suppose that $n, m \in \mathbb{Z}$. *Note: You may use algebraic properties of $\mathbb{Z}$ without proof.*

   (a) n^2 is odd if and only if n is odd.

   (b) If $n^2(n^2 - 2n)$ is odd then n is odd.

   (c) If $n + m \geq 10$ then either $n \geq 5$ or $m \geq 5$.

   (d) If both the product nm and the sum $n + m$ are even, then both n and m are even.

(2) Prove that there is no rational solution to $x^3 = 2$.