Proof by contradiction

1. Prove by contradiction that there is no greatest odd integer
2. Prove by contradiction that if n^2 is even, then n must be odd
3. Prove by contradiction that $\sqrt{2}$ is an irrational number
4. Prove by contradiction that there are infinitely many prime numbers
5. Prove by contradiction that if n^3 is even, then n is even
6. Prove by contradiction that if pq is even then at least one of p and q is even.