You must show your work to get full credit.

- 1. Give our official definitions of the following:
 - (a) n is a even integer.
 - (b) n is an odd integer.
- **2.** Prove or give a counter example: If x and y odd, then $x^2 + 3y^3$ is odd.

3. Prove or give a counter example: If x is odd, then $x^2 + 1$ is even.