

Pin:  
Name:

- . **Conjecture 1.** For each integer  $a$ , if  $a^2 \equiv 4 \pmod{8}$  then  $a \equiv 2 \pmod{8}$ .
1. Symbolically write Conjecture 1.
  2. State whether Conjecture 1 is true or false.
  3. Justify your answer to the previous part. You should understand that this means the following. If Conjecture 1 is true, then provide a proof of Conjecture 1. If Conjecture 1 is false, then provide a counterexample and clearly explain why the counterexample is indeed a counterexample.

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