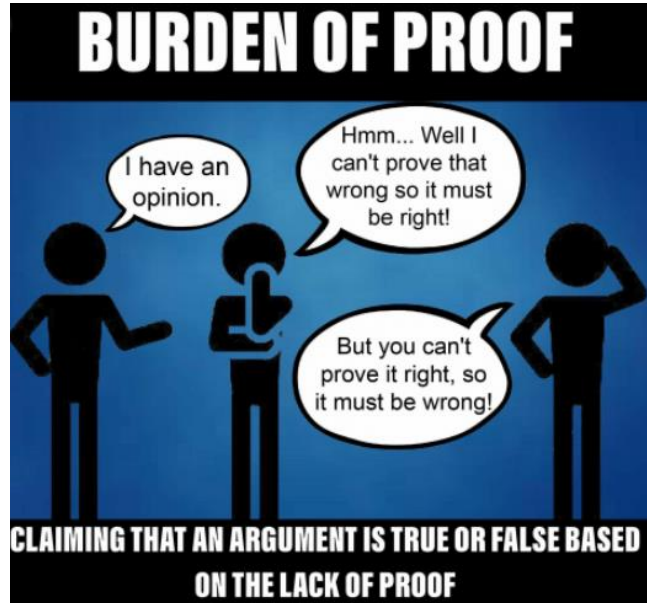


**DISPROOF** (chapter 9)



Exercises for Chapter 9 (Hammack)

Each of the following statements is false. Disprove it.

1. If  $x, y \in \mathbb{R}$ , then  $|x + y| = |x| + |y|$ .
2. For every natural number  $n$ , the integer  $2n^2 - 4n + 31$  is prime.
3. If  $n \in \mathbb{Z}$  and  $n^5 - n$  is even, then  $n$  is even.
4. For every natural number  $n$ , the integer  $n^2 + 17n + 17$  is prime.
5. If  $A, B$ , and  $C$  are sets, and  $A \times C = B \times C$ , then  $A = B$ .
6. If  $a, b \in \mathbb{N}$ , then  $a + b < ab$ .
7. If  $a, b, c \in \mathbb{N}$  and  $ab, bc$  and  $ac$  all have the same parity, then  $a, b$  and  $c$  all have the same parity.
8. If  $A$  and  $B$  are sets, then  $P(A) \cap P(B) = P(A \cap B)$ .
9. If  $A$  and  $B$  are finite sets, then  $|A \cup B| = |A| + |B|$ .
10. For all sets  $A$  and  $B$ , if  $A - B = \emptyset$ , then  $B = \emptyset$ .
11. The inequality  $2x \geq x + 1$  is true for all positive real numbers  $x$ .
12. Suppose  $A, B$ , and  $C$  are sets. If  $A = B - C$ , then  $B = A \cup C$ .
13. The equation  $x^2 = 2x$  has three real solutions.
14. There exist integers  $a$  and  $b$  for which  $42a + 7b = 1$ .
15. If  $X \subseteq A \cup B$ , then  $X \subseteq A$  or  $X \subseteq B$ .