

1. Disproving the statement P means proving

2. Disprove each false statement below by **first** stating what you need to show and then providing a complete disproof.

(a) If $n \in \mathbb{Z}$ and $n^5 - 3n$ is even, then n is even.

(b) There exists a real number such that $x^2 < x < |x|$.

(c) For all sets A and B , if $A - B = \emptyset$, then $B \neq \emptyset$.

3. Prove or disprove the statements below.

(a) Every odd integer is the sum of three odd integers.

(b) If A and B are sets, then $\mathcal{P}(A) - \mathcal{P}(B) \subseteq \mathcal{P}(A - B)$.

(c) For all $a, b, c \in \mathbb{N}$, if $a \mid bc$, then $a \mid b$ or $a \mid c$.