Readiness Assessment

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Problem 2(a). Give the negation of: For all $x \in A$, there exists $y \in B$ such that $x + y = -1$.

Solution. There exists $x \in A$ such that for all y in B, $x + y \neq -1$ □

Problem 2(b). Give the contrapositive of: "If $y \in A$, then $y \in A \cap B$."

Solution. If $y \notin A \cap B$, then $y \notin A$. □

Problem 2(c). Is the statement in (b) true?

Solution. No, the statement in (b) is false. Let A be the set of integers, B be the set of even integers, and y be 1. Y is an integer, so it is in A. But it is odd, so it is not in B. Because the statement is false, its contrapositive must also be false. □