

1. Consider the statement:

Every odd natural number is the sum of two prime numbers.

- (a) Rephrase the statement so that it has the form “For every natural number n , if ... then ...”
- (b) Translate the statement into symbols, using $O(n)$ to represent “ n is odd”, $P(n)$ to represent “ n is prime” and $S(n, m, k)$ to represent “ $n + m = k$ ”.

2. For any integer n , let $A(n)$ be the implication

“If n is even then $2n$ is even.”

- (a) What is the converse of $A(n)$?
- (b) What is the contrapositive of $A(n)$?
- (c) What is the negation of $A(n)$?

3. Show that for any integer x , x^3 is even if and only if x is even.