

Negation of statement A: a statement B whose assertion specifically denies the truth of statement A.

1. Negate the below statements and express the negations in English avoiding the use of negation words whenever possible.
 - (a) There is a vaccine in the world that is not safe for lizard.
 - (b) All pairs of students who participated in Geometry Mela stood atleast 6 feet apart.
 - (c) In Breakout room 2 of online class in SWMS all students were silent.
 - (d) During the month of May Siva, Sanitized his hands every hour.
 - (e) There is one person in Immunity's birthday party who is not wearing a mask.
 - (f) Every student in this class has taken Tulu or Kokborok in Class XII.
 - (g) Every student in this class has taken Mathematics and Biology in Class XII.
 - (h) In every batch of SWMS there is a student who has taken neither Mathematics nor Biology in high school.
2. Let us introduce **Logical Notation:**
 - \forall to mean for all;
 - \exists to mean there exists;
 - \implies to mean implies; and
 - \iff to mean equivalent.

Here is an example of usage of notation:

Statement : For all $\epsilon > 0$ there is an N such that for all $n \geq N$, $a_n \in (a - \epsilon, a + \epsilon)$.

Statement in logical Notation: $\forall \epsilon > 0, \exists N$ such that $\forall n \geq N, a_n \in (a - \epsilon, a + \epsilon)$.

- (a) We say $\lim_{n \rightarrow \infty} a_n = 3$ if

For every $\epsilon > 0$ there exists $N > 0$ such that $|a_n - 3| < \epsilon$ whenever $n \geq N$.

- i. Provide three examples of sequences that converge to 3.
- ii. Provide three examples of sequences that do not converge to 3.
- iii. Provide an example of sequence that does not converges to any real number.
- iv. Write a logical statement that is equivalent to saying $\lim_{n \rightarrow \infty} a_n \neq 3$
- v. Write a logical statement that is equivalent to saying that the sequence a_n does not converge to any real number.