

# 11 Lecture - MTH101

## Important Subjective

1. **What is the definition of a limit in calculus?**

**Answer:** The limit of a function  $f(x)$  as  $x$  approaches  $a$  is the value that  $f(x)$  approaches as  $x$  gets closer and closer to  $a$ .

2. **What is the difference between a one-sided limit and a two-sided limit?**

**Answer:** A one-sided limit only considers the behavior of the function from one side of a point, while a two-sided limit considers the behavior of the function from both sides of the point.

3. **What is an indeterminate form in calculus?**

**Answer:** An indeterminate form is a mathematical expression that is not well-defined, such as  $0/0$  or  $\infty/\infty$ .

4. **What is L'Hopital's rule, and when is it used to evaluate limits?**

**Answer:** L'Hopital's rule is a method for evaluating limits that involve taking the derivative of the numerator and denominator separately and then evaluating the limit again. It is used when we have an indeterminate form of the type  $0/0$  or  $\infty/\infty$ .

5. **What is the Squeeze theorem, and when is it used to evaluate limits?**

**Answer:** The Squeeze theorem is a method for evaluating limits that involve bounding a function between two other functions, and if the limits of the two bounding functions are equal, then the limit of the bounded function is also equal to that limit.

6. **What is the meaning of a limit that equals infinity?**

**Answer:** If a limit equals infinity, it means that the function grows without bounds as  $x$  approaches the limiting value.

7. **What is the meaning of a limit that equals negative infinity?**

**Answer:** If a limit equals negative infinity, it means that the function decreases without bound as  $x$  approaches the limiting value.

8. **What is the difference between a removable and non-removable discontinuity in a function?**

**Answer:** A removable discontinuity is a point where the function is undefined, but it can be made continuous by defining the function at that point. A non-removable discontinuity is a point where the function cannot be made continuous.

9. **What is the limit of a constant function?**

**Answer:** The limit of a constant function is equal to the constant value at any point.

10. **Can a function have a limit that does not exist?**

**Answer:** Yes, a function can have a limit that does not exist if the function oscillates or jumps around the limiting value.