

30 Lecture - MTH101

Important Mcqs

What does the First Fundamental Theorem of Calculus establish?

- a. A connection between integration and differentiation
- b. A connection between differentiation and limits
- c. A connection between limits and series
- d. None of the above

Answer: a. A connection between integration and differentiation

What is the formula for the First Fundamental Theorem of Calculus?

- a. $\int_a^b f(x) dx = F(b) - F(a)$
- b. $F(x) = \int_a^x f(t) dt$
- c. $F(x) = f(x)$
- d. None of the above

Answer: b. $F(x) = \int_a^x f(t) dt$

What is the significance of the First Fundamental Theorem of Calculus?

- a. It provides a powerful tool for solving problems that involve finding the area under a curve
- b. It allows us to calculate the derivative of the definite integral of a function
- c. It enables us to find the slope of a tangent line to a curve at any point
- d. All of the above

Answer: d. All of the above

What is the relationship between the derivative of the definite integral and the original function?

- a. They are equal
- b. They are opposite in sign

- c. They are proportional
- d. None of the above

Answer: a. They are equal

What is the condition for the First Fundamental Theorem of Calculus to hold?

- a. The function must be continuous on the interval $[a, b]$
- b. The function must be differentiable on the interval $[a, b]$
- c. The function must be both continuous and differentiable on the interval $[a, b]$
- d. None of the above

Answer: a. The function must be continuous on the interval $[a, b]$

What is the role of the limit concept in the proof of the First Fundamental Theorem of Calculus?

- a. To define the definite integral
- b. To show that the Riemann sum approaches the definite integral as the number of subintervals increases
- c. To calculate the derivative of the definite integral
- d. None of the above

Answer: b. To show that the Riemann sum approaches the definite integral as the number of subintervals increases

What is the application of the First Fundamental Theorem of Calculus in physics?

- a. To calculate the total distance traveled by an object
- b. To calculate the present value of future cash flows
- c. To find the maximum or minimum values of a function
- d. None of the above

Answer: a. To calculate the total distance traveled by an object

What is the application of the First Fundamental Theorem of Calculus in economics?

- a. To calculate the total revenue of a company
- b. To calculate the present value of future cash flows

- c. To find the marginal cost or revenue of a product
- d. None of the above

Answer: b. To calculate the present value of future cash flows

Is the First Fundamental Theorem of Calculus applicable only to continuous functions?

- a. Yes
- b. No
- c. Sometimes
- d. It depends on the interval

Answer: a. Yes

What is the difference between the First and Second Fundamental Theorem of Calculus?

- a. The First Fundamental Theorem relates integration and differentiation, while the Second Fundamental Theorem relates definite and indefinite integrals
- b. The First Fundamental Theorem relates differentiation and limits, while the Second Fundamental Theorem relates integration and series
- c. The First Fundamental Theorem relates integration and limits, while the Second Fundamental Theorem relates differentiation and series
- d. None of the above

Answer: a