6 Lecture - MTH101

Important Mcqs

1. What is the limit of the function f(x) = 2x + 1 as x approaches 3?
a) 5
b) 7
c) 8
d) 9
Answer: b) 7

Solution: When x approaches 3, the value of f(x) approaches (2*3 + 1) = 7.

2. Which of the following functions is continuous at x = 0?
a) f(x) = 1/x
b) f(x) = x^2
c) f(x) = |x|
d) f(x) = sqrt(x)
Answer: b) f(x) = x^2

Solution: The function $f(x) = x^2$ is continuous at x = 0 because the limit of f(x) as x approaches 0 is equal to f(0) = 0.

3. What is the derivative of the function f(x) = x^3?
 a) 3x^2
 b) 2x^3
 c) 4x^3
 d) x^2
 Answer: a) 3x^2

Solution: The derivative of $f(x) = x^3$ is $f'(x) = 3x^2$.

- 4. What is the integral of the function f(x) = 1/x?
 a) ln(x) + C
 b) x²/2 + C
 - c) 2x + C d) e^x + C

Answer: a) ln(x) + C

Solution: The integral of f(x) = 1/x is $F(x) = \ln|x| + C$.

- 5. What is the domain of the function f(x) = sqrt(x 4)?
 a) (-infinity, 4]
 b) [4, infinity)
 - c) [0, infinity)
 d) (-infinity, infinity)

Answer: b) [4, infinity)

	plution: The function $f(x) = sqrt(x - 4)$ is defined only for $x >= 4$, which gives the domain [4, finity).
6.	What is the limit of the function f(x) = sin(x)/x as x approaches 0? a) 0 b) 1 c) -1 d) does not exist Answer: b) 1
	olution: The limit of f(x) = sin(x)/x as x approaches 0 is 1, which can be proved using Hopital's rule or the squeeze theorem.
7.	Which of the following functions is not differentiable at $x = 0$? a) $f(x) = x $ b) $f(x) = x^2$ c) $f(x) = \text{sqrt}(x)$ d) $f(x) = 1/x$ Answer: a) $f(x) = x $
Solution: The function $f(x) = x $ is not differentiable at $x = 0$ because it has a sharp point at that point.	
8.	What is the integral of the function f(x) = 2x? a) x^2 + C b) x^2 + 1 c) x^3 + C d) 2x^2 + C Answer: a) x^2 + C
Solution: The integral of $f(x) = 2x$ is $F(x) = x^2 + C$.	
9.	What is the limit of the function f(x) = (x^2 - 4)/(x - 2) as x approaches 2? a) 0 b) 1 c) 2 d) does not exist

Answer: c)