# 18 Lecture - MTH101

## **Important Mcqs**

What is the chain rule used for in calculus?
A) Integration
B) Derivatives
C) Limits
D) Sequences
Solution: B
Which of the following functions cannot be differentiated using the chain rule:
$A) f(x) = \sin(x^2)$
B) $f(x) = e^x + \ln(x)$
C) $f(x) = \cos(3x)$
D) $f(x) = x^2 + x + 1$
Solution: D
What is the derivative of $f(x) = \sin(2x)$ using the chain rule?
A) 2cos(2x)
B) 2sin(2x)
C) 4cos(2x)
D) 4sin(2x)
Solution: B
What is the derivative of $f(x) = e^{(3x+2)}$ using the chain rule?
A) $3e^{(3x+2)}$
B) $e^{3x+2}$

- C)  $3e^{(3x)}$
- D)  $2e^{(3x+2)}$

## Solution: A

### What is the chain rule formula?

- A)  $f'(x) = \lim_{x \to 0} (h->0) (f(x+h)-f(x))/h$
- B) f(x) = ? g'(x)dx
- C) (f(g(x)))' = f'(x)g'(x)
- D) (f(g(x)))' = f'(g(x))g'(x)

## Solution: D

## What is an example of a composite function?

- A)  $f(x) = x^2$
- B) f(x) = 3x + 4
- C)  $f(x) = \sin(x)$
- D)  $f(x) = \sin(x^2)$

#### Solution: D

## Which of the following is the correct order for applying the chain rule?

- A) Differentiate the inner function, then the outer function
- B) Differentiate the outer function, then the inner function
- C) Multiply the inner and outer functions, then differentiate
- D) There is no specific order

#### Solution: B

## What is the derivative of $f(x) = \ln(\cos(x))$ using the chain rule?

- A) tan(x)
- $B) \cot(x)$
- C) -sec(x)

Can the chain rule be applied to a function composed of more than two functions?
A) Yes
B) No
Solution: A
Which of the following is a way to remember the chain rule?
A) Outside inside
B) Inside outside
C) Middle first
D) There is no way to remember it
Solution: A

D) -csc(x)

Solution: -tan(x)