## 16 Lecture - MTH101

## **Important Mcqs**

What is the derivative of  $f(x) = x^3 + 4x^2 - 5x - 2$ ?

a) 
$$f'(x) = 3x^2 + 8x - 5$$

b) 
$$f'(x) = 3x^2 + 8x + 5$$

c) 
$$f'(x) = 3x^3 + 8x^2 - 5x - 2$$

d) 
$$f'(x) = 3x^2 + 4x - 5$$

Solution: The derivative of f(x) is  $f'(x) = 3x^2 + 8x - 5$ . Therefore, the correct answer is an option (a).

What is the derivative of  $f(x) = \sin(x)\cos(x)$ ?

- a) f'(x) = cos(x)sin(x)
- b)  $f'(x) = \cos^2(x) \sin^2(x)$
- c)  $f'(x) = -\sin(x)\cos(x)$
- d)  $f'(x) = 2\cos(x)\sin(x)$

Solution: Using the product rule, we get  $f'(x) = \cos(x)\cos(x) - \sin(x)\sin(x) = \cos^2(x) - \sin^2(x)$ . Therefore, the correct answer is option (b).

What is the derivative of  $f(x) = 3x^4 - 2x^3 + 5x^2 - 4x + 1$ ?

a) 
$$f'(x) = 12x^3 - 6x^2 + 10x - 4$$

b) 
$$f'(x) = 12x^3 - 6x^2 + 5x - 4$$

c) 
$$f'(x) = 3x^3 - 2x^2 + 5x - 4$$

d) 
$$f'(x) = 3x^3 - 2x^2 + 10x - 4$$

Solution: The derivative of f(x) is  $f'(x) = 12x^3 - 6x^2 + 10x - 4$ . Therefore, the correct answer is option (a).

What is the derivative of  $f(x) = e^x \cos(x)$ ?

a) 
$$f'(x) = e^x \sin(x)$$

b) 
$$f'(x) = e^x(\cos(x) + \sin(x))$$

- c)  $f'(x) = e^x(\cos(x) \sin(x))$
- d)  $f'(x) = e^x(\cos(x) \cos(x))$

Solution: Using the product rule, we get  $f'(x) = e^x \cos(x) - e^x \sin(x) = e^x (\cos(x) - \sin(x))$ . Therefore, the correct answer is option (c).

What is the derivative of  $f(x) = \ln(5x)$ ?

- a) f'(x) = 1/(5x)
- b)  $f'(x) = 5\ln(x)$
- c)  $f'(x) = 5/(\ln(x))$
- d) f'(x) = 1/x

Solution: Using the chain rule, we get f'(x) = 1/(5x). Therefore, the correct answer is option (a).

What is the derivative of  $f(x) = x^2 \ln(x)$ ?

- a)  $f'(x) = 2x \ln(x) + x$
- b)  $f'(x) = x \ln(x)$
- c)  $f'(x) = 2x \ln(x) + 2x$
- d)  $f'(x) = 2x \ln(x) + x^2$

Solution: Using (a)