

# 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)