MTH101: Practice Exercise
Lecture No.20: Derivatives of Logarithmic and Exponential Functions

Q.No.1

Differentiate: $y=(5-x)^{\sqrt{x}}$.

Answer: $\frac{dy}{dx}=\left(\frac{\ln(5-x)}{2\sqrt{x}}-\frac{\sqrt{x}}{(5-x)}\right).(5-x)^{\sqrt{x}}$

Q.No.2

Differentiate $y=(\cos x)^{8x}$ with respect to $'x'$.

Answer: $\frac{dy}{dx}=\left(8\ln(\cos x)-\frac{8x\sin x}{\cos x}\right)(\cos x)^{8x}$

Q.No.3

Differentiate $y=x^{\sin 5x}$ with respect to $'x'$.

Answer: $\frac{dy}{dx}=\left(5(\cos 5x).\ln(x)+\frac{\sin 5x}{x}\right)\left(x^{\sin 5x}\right)$

Q.No.4

Differentiate $y=x\,e^{3x+4}$.

Answer: $\frac{dy}{dx}=e^{3x+4}+3xe^{3x+4}$

Q.No.5

Find the derivative of the function $y=\ln(2+x^5)$ with respect to $'x'$.

Answer: $\frac{dy}{dx}=\frac{5x^4}{(2+x^5)}$