CONTINUITY AND DIFFERENTIABILITY

EXPONENTIAL AND LOGARITHMIC FUNCTIONS

EXERCISE

Q.1 Take the derivative $8e^{-x} + 2e^{x}$ with respect to x.

(a) $2e^{-x} + 8e^{x}$ (b) $2e^{x} + 8e^{-x}$ (c) $2e^{-x} - 8e^{x}$ (d) $2e^{x} - 8e^{-x}$

Q.2 Differentiate $8e^{\cos 2x}$ with respect to x.

(a) $16 \sin 2xe^{\cos 2x}$ (b) $-16 \sin 2xe^{\cos 2x}$

(c) $-16 \sin 2xe^{\cos -2x}$ (d) $16 \sin 2xe^{-\cos 2x}$

Q.3 Find the derivative $3 \sin^{-1}(e^{2x})$ with respect to x.

(a) $\frac{6e^{2}x}{\sqrt{1-e^{4x}}}$ (b) $\frac{2e^{2}x}{\sqrt{1-e^{4x}}}$ (c) $-\frac{6e^{2}x}{\sqrt{1-e^{4x}}}$ (d) $\frac{6e^{-2x}}{\sqrt{1-e^{4x}}}$

Q.4 Take the derivative $\log(\log x^{5})$ with respect to x.

(a) $-\frac{5}{x \log x^{5}}$ (b) $\frac{1}{\log x^{5}}$ (c) $\frac{5}{x \log x^{5}}$ (d) $-\frac{1}{x \log x^{5}}$

Q.5 Differentiate $3e^{3x^{3}}$ with respect to x.

(a) $27x^{-2}e^{3x^{3}}$ (b) $27x^{2}e^{3x^{3}}$ (c) $-27x^{2}e^{3x^{3}}$ (d) $-27x^{-2}e^{3x^{3}}$

Q.6 Find the derivative $5e^{x^{2}} \tan x$ with respect to x.

(a) $5e^{x^{2}}(1+\tan x)^{2}$ (b) $-5e^{x^{2}}(1+\tan x)^{2}$

(c) $5e^{x^{2}}(1-\tan x)^{2}$ (d) $-5e^{x^{2}}(1-\tan x)^{2}$

Q.7 Determine the derivative $\log\left(e^{5x^{3}}\right)$ with respect of x.

(a) $\frac{-15x^{2}}{e^{5x^{3}}}$ (b) $\frac{15x^{2}}{e^{5x^{3}}}$ (c) $15x^{2}$ (d) $-15x^{2}$

Q.8 Find the derivative $7\log\left(x^4.5e^{x^3}\right)$ with respect of x.

(a) $\frac{7\left(4+3x^3\right)}{x^2}$ (b) $\frac{7\left(4-3x^3\right)}{x}$ (c) $-\frac{7\left(4+3x^3\right)}{x}$ (d) $\frac{7\left(4+3x^3\right)}{x}$

Q.9 Take the derivative $2e^{x^4}$ with respect to x.

(a) $\frac{2e^{x^4}\left(4x^4\log x+1\right)}{x^2}$ (b) $\frac{e^{x^4}\left(4x^4\log x+1\right)}{x}$

(C) $\frac{2e^{x^4}\left(4x^4\log x+1\right)}{x}$ (d) $-\frac{2e^{x^4}\left(4x^4\log x+1\right)}{x}$

Q.10 Derive $\log\left(\cos\left(\sin\left(e^{x^3}\right)\right)\right)$ with respect to x.

(a) $-3x^2e^{x^3}\cos e^{x^3}\tan\left(\sin e^{x^3}\right)$ (b) $3x^2e^{x^3}\cos e^{x^3}\tan\left(\sin e^{x^3}\right)$

(c) $-3e^{x^3}\cos e^{x^3}\cos\left(\sin e^{x^3}\right)$ (d) $-x^2e^{x^3}\cos e^{x^3}\tan\left(\sin e^{x^3}\right)$

ANSWER KEY

1. (d)

2. (B)

3. (A)

4. (C)

5. (B)

6. (A)

7. (C)

8. (D)

9. (C)

10. (A)