

Differentiation

Q.1 $\frac{d}{dx}(u + v - w) =$

(A) $\left(\frac{du}{dx} \pm \frac{dv}{dx}\right) \frac{dw}{dx}$

(B) $-\frac{du}{dx} + \frac{dv}{dx} - \frac{dw}{dx}$

(C) $\frac{du}{dx} - \frac{dw}{dx} + \frac{dv}{dx}$

(D) $\frac{du}{dx} - \frac{dv}{dx} + \frac{dw}{dx}$

Q.2 $\frac{d}{dx}\left(\frac{u}{v}\right) =$

(A) $\frac{1}{v}\left(\frac{du}{dx} - \frac{u}{v} \frac{dv}{dx}\right)$

(B) $\frac{1}{u}\left(\frac{v}{u} \frac{du}{dx} - \frac{dv}{dx}\right)$

(C) $\frac{1}{u}\left(\frac{u}{v} \frac{du}{dx} - \frac{dv}{dx}\right)$

(D) $\frac{1}{v}\left(\frac{u}{v} \frac{dv}{dx} - \frac{du}{dx}\right)$

Q.3 $\frac{d}{dx}(u^n) =$

(A) nu^{n-1}

(B) $nu^{n-1} \frac{du}{dx}$

(C) zero

(D) None of these

Q.4 $\frac{d}{dx}(x^5 + x^7 + x^9) =$

(A) $\frac{x^6}{6} + \frac{x^8}{8} + \frac{x^{10}}{10}$

(B) $5x^4 + 7x^6 + 9x^8$

(C) $\frac{x^5}{5} + \frac{x^7}{7} + \frac{x^9}{9}$

(D) $5x^3 + 7x^5 + 9x^7$

Q.5 $\frac{d}{dx}(x \log_e x - x) =$

(A) zero

(B) 1

(C) $\log_e x$

(D) $x \log_e x$

Q.6 $\frac{d}{dx}(x \log_e x) =$

(A) 1

(B) $1 + \log_e x$

(C) $1 - \log_e x$

(D) $\log_e x$

Q.7 $\frac{d}{dx}\left(\frac{1}{x} + \tan x + x^2 + \log_e x\right) =$

(A) $-\frac{1}{x^2} + \sec^2 x + 2x + \frac{1}{x}$

(B) $\frac{1}{x^2} - \sec^2 x - 2x + \frac{1}{x}$

(C) $-\frac{1}{x^2} - \sec^2 x + 2x - \frac{1}{x}$

(D) $-\frac{1}{x^2} + \sec x \tan x + 2x + \frac{1}{x}$

Q.8 $y = \sin x + x^4$

(A) $\frac{dy}{dx} = -\cos x + 4x^3$

(B) $\frac{dy}{dx} = \sin x + 4x^3$

(C) $\frac{d^2y}{dx^2} = -\sin x + 12x^2$

(D) $\frac{d^2y}{dx^2} = -\cos x + 6x^2$

Q.9 $y = e^x \sin x$

(A) $\frac{dy}{dx} = e^x(\cos x - \sin x)$

(B) $\frac{dy}{dx} = e^x \cos x$

(C) $\frac{d^2y}{dx^2} = 2e^x \sin x$

(D) $\frac{d^2y}{dx^2} = 2e^x \cos x$

(Physics)

BASIC MATHEMATICS

Q.10 $\frac{d}{dx}(x^4 - 2\sin x + 3\cos x)$

(A) $4x^3 - 2\cos x + 3\sin x$

(B) $3x^2 + 2\cos x + 3\sin x$

(C) $4x^3 + 2\cos x - 3\sin x$

(D) $4x^3 - 2\cos x - 3\sin x$

Q.11 $xy = c^2$, then $\frac{dy}{dx}$

(A) $\frac{x}{y}$

(B) $\frac{y}{x}$

(C) $-\frac{x}{y}$

(D) $-\frac{y}{x}$

Q.12. If $x = at^2$ and $y = 2at$, then $\frac{dy}{dx}$

(A) t

(B) $\frac{1}{t}$

(C) 1

(D) None of these

Q.13 If $y = \sin^3 x - 3\sec^2 x$, then $\frac{dy}{dx}$ at $x = \frac{\pi}{3}$ is

(A) $\frac{9-96\sqrt{3}}{4}$

(B) $\frac{9-86\sqrt{3}}{4}$

(C) $\frac{9-76\sqrt{3}}{2}$

(D) None of these

Q.14 If $y = x^3 + 2x + 1$, then $\frac{dy}{dx}$ at $x = 1$ is

(A) 6

(B) 7

(C) 8

(D) 5

ANSWER KEY

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| 1. | (C) | 2. | (A) | 3. | (B) | 4. | (B) | 5. | (C) | 6. | (B) | 7. | (A) |
| 8. | (C) | 9. | (D) | 10. | (D) | 11. | (D) | 12. | (B) | 13. | (A) | 14. | (D) |

A