Physicsaholics

DPP – 4 (Basic Maths)

Video Solution on Website:- https://physicsaholics.com/home/courseDetails/36

Video Solution on YouTube:- https://youtu.be/McgpGuEFHaU

Written Solution on Website:- https://physicsaholics.com/note/notesDetalis/70

Q 1. What is the derivative of $1 + 2\cos x$ w.r.t. 'x'??
(a) $1 + 2\cos x$ (b) $-2\tan x$ (c) $1 - 2\sin x$ (d) $-2\sin x$

Q 2. Differentiate w.r.t. 'x' if $y = 3\sin x - 2$
(a) $\frac{dy}{dx} = 3$ (b) $\frac{dy}{dx} = 3\cos x$ (c) $\frac{dy}{dx} = 3\cos x - 2$ (d) $\frac{dy}{dx} = 3\sin x$

Q 3. Differentiate w.r.t. 'x' if $y = \cos x - 2x$
(a) $\frac{dy}{dx} = \cos x - 2$ (b) $\frac{dy}{dx} = \sin x - 2$ (c) $\frac{dy}{dx} = -\sin x - 2$ (d) None of these

Q 4. What is the derivative of constant?
(a) 1 (b) zero
(c) ∞ (d) cannot be determined

Q 5. Find the derivative of the function: $F(x) = 6x^3 - 9x + 4$, w.r.t. 'x':
(a) $F'(x) = 18x^2 + 9$ (b) $F'(x) = 6x^2 - 9x$
(c) $F'(x) = 18x^2 - 9$ (d) None of these

Q 6. Find the value of $\frac{dy}{dx}$ at x= 2, y = $\ln x^2$:
(a) 2 (b)1 (c) $\frac{2}{x}$ (d) None of these

Q 7. Given $S = t^2 + 5t + 3$, find $\frac{dS}{dt}$
(a) $2t + 5 + \frac{3}{t}$ (b) $2t + 5$ (c) $2t$ (d) $t + 5$

Q 8. If $y = 3x^5 - 3x - \frac{1}{x}$, Find $\frac{dy}{dx}$?
(a) $15x^4 - 3 + \frac{2}{x^2}$ (b) $15x^4 + 3 + \frac{1}{x^2}$ (c) $15x^4 - 3 + \frac{1}{x^2}$ (d) $15x^4 - 3 - \frac{1}{x^2}$

Q 9. If $y = 6x^7 - 4x^5 + 5x^4 + 5x^2 - 40$, find $\frac{dy}{dx}$?
(a) $42x^6 - 20x^4 + 20x^3 + 5x - 40$
(b) $42x^6 - 20x^4 + 25x^3 + 5x$
(c) $42x^6 - 20x^4 + 20x^3 + 10x - 40$
(d) $42x^6 - 20x^4 + 20x^3 + 10x$

Q10. $y = \left(x + \frac{1}{x}\right)^2$, Find $\frac{dy}{dx}$?

(a) $\left(x + \frac{1}{x}\right)$ (b) $2x + \frac{1}{x^2}$ (c) $2x - \frac{1}{x^2}$ (d) $2x - \frac{2}{x^3}$

Q 11. Find the derivative of the function: $F(x) = 10\sqrt[5]{x^3} - \sqrt{x^7} + 6\sqrt[3]{x^8} - 3$, w.r.t. 'x':

(a) $F'(x) = 6x^{-\frac{2}{5}} - \frac{7}{2}x^{\frac{5}{2}} + 16x^{\frac{5}{3}}$ (b) $F'(x) = 10x^{-\frac{2}{5}} - \frac{1}{2}x^{\frac{5}{2}} + 6x^{\frac{5}{3}}$

(c) $F'(x) = 6x^{-\frac{5}{2}} - \frac{7}{2}x^{\frac{7}{2}} + 16x^{\frac{8}{3}}$ (d) None of these

Q 12. Differentiate w.r.t. 'x' if $y = 15\sin x - 2e^x - \frac{1}{2}x^2 + 5$

(a) $\frac{dy}{dx} = 15\cos x - 2xe^x - 2x$ (b) $\frac{dy}{dx} = 15\cos x - 2e^x - x$

(c) $\frac{dy}{dx} = 15\cos x - 2$ (d) $\frac{dy}{dx} = 15\sin x - 2e^x - 2x$

Q 13. Differentiate w.r.t. 'x' if $y = 2\,ln\,x - 2x^2 - 3\cos x + 1$

(a) $\frac{dy}{dx} = 2e^x - 4x - 3\sin x$ (b) $\frac{dy}{dx} = \frac{2}{x} - 4x - 3\sin x$

(c) $\frac{dy}{dx} = 2e^x - 4x + 3\sin x$ (d) $\frac{dy}{dx} = \frac{2}{x} - 4x + 3\sin x$

Q 14. Differentiate w.r.t. 'x' if $y = x^{\frac{5}{2}} + ln\,x + 2\sin x$

(a) $\frac{dy}{dx} = \frac{5}{2}x^{\frac{3}{2}} + \frac{1}{x} + 2\cos x$ (b) $\frac{dy}{dx} = \frac{5}{2}x^{\frac{3}{2}} - \frac{1}{x} - 2\cos x$

(c) $\frac{dy}{dx} = x^{\frac{3}{2}} + \frac{1}{x} + 2\cos x$ (d) $\frac{dy}{dx} = x^{\frac{3}{2}} + \frac{1}{x} - 2\cos x$

Q 15. Differentiate w.r.t. 'x' if $y = \sin x - \cos x + \ln\left(\frac{1}{x}\right)$

(a) $\frac{dy}{dx} = \cos x - \sin x + \frac{1}{x}$ (b) $\frac{dy}{dx} = \cos x + \sin x + \frac{1}{x}$

(c) $\frac{dy}{dx} = \cos x + \sin x - \frac{1}{x}$ (d) None of these

Answer Key

Q.1 d	Q.2 b	Q.3 c	Q.4 b	Q.5 c
Q.6 b	Q.7 b	Q.8 c	Q.9 d	Q.10 d
Q.11 a	Q.12 b	Q.13 d	Q.14 a	Q.15 c

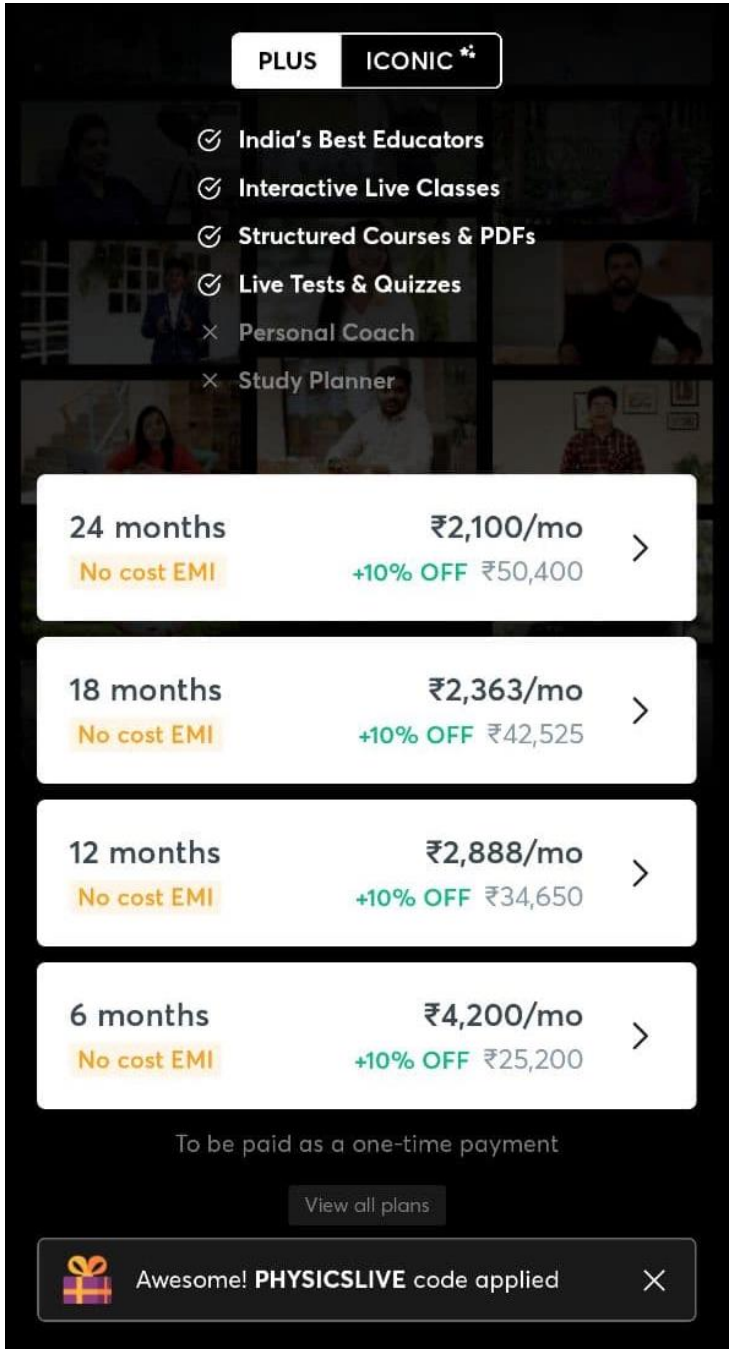
Plus leaderboard

Based on educator activity in last 30 days

1	Prateek Jain	11.4M mins
2	Ajay Mishra (Akm)	6.3M mins
3	Shubh Karan Choudhary (Skc)	5.9M mins
4	Dr Amit Gupta	5.5M mins
5	Ramesh Sharda	4.9M mins
6	Sandeep Nodiyal	4.8M mins
7	Shailendra Tanwar	3.6M mins
8	Vishal Vivek	2.7M mins
9	Garima Goel	2.7M mins
10	Saurabh Sharma	2.6M mins
11	Dr S K Singh	2.6M mins
12	Nishant Varshney	

PHYSICSLIVE

Use code PHYSICSLIVE to get Maximum OFF on Unacademy PLUS / Iconic and learn from India's Top Faculties



Written Solution

DPP-4 Basic Mathematics (Differentiation-1)

By Physicsaholics Team

Solution: 1

$$\frac{d}{dx}(1+2\cos x)$$

$$= \frac{d}{dx}(1) + 2\frac{d}{dx}(\cos x)$$

$$= 0 + 2(-\sin x)$$

$$= -2\sin x.$$

Ans (d)

Solution: 2

$$y = 3\sin x - 2$$

$$\frac{dy}{dx} = 3(\cos x) - 0$$

$$\boxed{\frac{dy}{dx} = 3\cos x}$$

Ans. b

Solution: 3

$$y = \cos x - 2x$$

$$\boxed{\frac{dy}{dx} = -\sin x - 2}$$

$$\therefore \frac{d}{dx}(\cos x) = -\sin x$$

Ans. c

Solution: 4

$$y = k$$

, where k = Constant.

$$\frac{dy}{dx} = \frac{d}{dx}(k)$$

$$\boxed{\frac{dy}{dx} = 0}$$

Ans. b

Solution: 5

$$f(x) = 6x^3 - 9x + 4$$

So, $\frac{d}{dx}(f(x)) = f'(x) = 6(3x^2) - 9(1) + 0$

$$\boxed{f'(x) = 18x^2 - 9}$$

Ans. c

Solution: 6

$$y = \ln x^2$$

$$\Rightarrow y = 2 \ln x$$

$$\Rightarrow \frac{dy}{dx} = 2 \frac{d}{dx}(\ln x) = \frac{2}{x}$$

at $x = 2$

$$\frac{dy}{dx} = \frac{2}{2} = 1$$

Ans. b

Solution: 7

$$S = t^2 + 5t + 3$$

$$\Rightarrow \frac{dS}{dt} = \frac{d}{dt}(t^2) + 5\frac{d}{dt}(t) + \frac{d}{dt}(3)$$

$$= 2t + 5$$

Ans. b

Solution: 8

$$y = 3x^5 - 3x - \frac{1}{x}$$

$$\Rightarrow \frac{dy}{dx} = 3\frac{d}{dx}(x^5) - 3\frac{d}{dx}(x) - \frac{d}{dx}(-x^{-1})$$

$$= 3 \times 5 x^4 - 3 - (-1)x^{-2}$$

$$= 15x^4 - 3 + \frac{1}{x^2}$$

Ans(c)

Solution: 9

$$y = 6x^7 - 4x^5 + 5x^4 + 5x^2 - 40$$

$$\Rightarrow \frac{dy}{dx} = 6\frac{d}{dx}(x^7) - 4\frac{d}{dx}(x^5) + 5\frac{d}{dx}(x^4) + 5\frac{d}{dx}(x^2) - \frac{d}{dx}(40)$$

$$= 6 \times 7x^6 - 4 \times 5 \times x^4 + 5 \times 4x^3 + 5 \times 2x - 0$$

$$= 42x^6 - 20x^4 + 20x^3 + 10x.$$

Ans(d)

Solution: 10

$$y = \left(x + \frac{1}{x}\right)^2$$

$$\Rightarrow \quad y = x^2 + x^{-2} + 2$$

$$\Rightarrow \quad \frac{dy}{dx} = \frac{d}{dx}(x^2) + \frac{d}{dx}(x^{-2}) + \frac{d}{dx}(2)$$

$$= 2x - 2x^{-2-1} + 0$$

$$= 2x - 2x^{-3}$$

$$= 2x - \frac{2}{x^3}$$

Ans(d)

Solution: 11

$$F(x) = 10\sqrt[5]{x^3} - \sqrt{x^7} + 6\sqrt[3]{x^8} - 3$$

$$F(x) = 10\,x^{3/5} - x^{7/2} + 6x^{8/3} - 3$$

So, $\frac{d}{dx}(F(x)) = F'(x)$

$$f'(x) = 10\left(\frac{3}{5}x^{\frac{3}{5}-1}\right) - \frac{7}{2}\left(x^{\frac{7}{2}-1}\right) + 6\left(\frac{8}{3}x^{\frac{8}{3}-1}\right) - 0$$

$$= 6x^{-\frac{2}{5}} - \frac{7}{2}x^{\frac{5}{2}} + 16x^{5/3}$$

$$\boxed{F'(x) = 6x^{-\frac{2}{7}} - \frac{7}{2}x^{\frac{5}{2}} + 16x^{5/3}}$$

Ans. a

Solution: 12

$$y = 15\sin x - 2e^x - \frac{1}{2}x^2 + 5$$

$$\frac{dy}{dx} = 15(\cos x) - 2e^x - \frac{1}{2}(2x) + 0$$

$$\boxed{\frac{dy}{dx} = 15\cos x - 2e^x - x}$$

Ans. b

Solution: 13

$$y = 2\ln x - 2x^2 - 3\cos x + 1$$

$$\frac{dy}{dx} = 2\left(\frac{1}{x}\right) - 4x - 3(-\sin x) + 0$$

$$\boxed{\frac{dy}{dx} = \frac{2}{x} - 4x + 3\sin x}$$

Ans. d

Solution: 14

$$y = x^{5/2} + \ln x + 2\sin x$$

$$\frac{dy}{dx} = \frac{5}{2}x^{\frac{5}{2}-1} + \frac{1}{x} + 2(\cos x)$$

$$\boxed{\frac{dy}{dx} = \frac{5}{2}x^{3/2} + \frac{1}{x} + 2\cos x}$$

Ans. a

Solution: 15

$$y = \sin x - \cos x + \ln\left(\frac{1}{x}\right)$$

$$y = \sin x - \cos x + \ln(x^{-1})$$

$$y = \sin x - \cos x - \ln(x)$$

$$\frac{dy}{dx} = \frac{d}{dx}(\sin x - \cos x - \ln x)$$

$$= \cos x - (-\sin x) - \left(\frac{1}{x}\right)$$

$$\boxed{\frac{dy}{dx} = \cos x + \sin x - \frac{1}{x}}$$

Ans. c

For Video Solution of this DPP, Click on below link

Video Solution on Website:- https://physicsaholics.com/home/courseDetails/36

Video Solution on YouTube:- https://youtu.be/McgpGuEFHaU

Written Solution on Website:- https://physicsaholics.com/note/notesDetalis/70

SUBSCRIBE

@Physicsaholics

@Physicsaholics_prateek

@NEET_Physics
@IITJEE_Physics

physicsaholics.com

Unacademy

CLICK

Chalo Niklo