

Topic : Mathematical Tools

Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.3

(3 marks, 3 min.)

M.M., Min.

[9, 9]

Subjective Questions ('-1' negative marking) Q.4 to Q.8

(4 marks, 5 min.)

[20, 25]

Comprehension ('-1' negative marking) Q.9 to Q.10

(3 marks, 3 min.)

[6, 6]

1. $y = x^3 + 2x^2 + 7x + 8$ then $\frac{dy}{dx}$ will be -
 (A) $3x^2 + 2x + 15$ (B) $3x^2 + 4x + 7$ (C) $x^3 + 2x^2 + 15$ (D) $x^3 + 4x + 7$
2. Differentiation of $2x^2 + 3x$ w.r.t. x is :
 (A) $4x + 3$ (B) $4x$ (C) 3 (D) $4x + 1$
3. Equation of straight line is $2x + 3y = 5$. Slope of the straight line is :
 (A) $3/2$ (B) $2/3$ (C) $-2/3$ (D) $-3/2$
4. $y = x^4 + 3x^2 + \pi + 2$. Find $\frac{dy}{dx}$:
5. $y = 4 + 5x + 7x^3$. Find $\frac{dy}{dx}$:
6. Find slope of a straight line $2x - 5y + 7 = 0$
7. $y = x + x^2 + \frac{1}{x} + \frac{1}{x^3}$. Find $\frac{dy}{dx}$
8. $y = x^2 + \frac{1}{x^2}$. Find $\frac{dy}{dx}$

COMPREHENSION

If $S = ut + \frac{1}{2}at^2$

Where ; S is displacement, u - initial velocity (constant) , v - final velocity , a - acceleration(constant) & t - time taken then -

9. Differentiation of 'S' w.r.t. 't' will be -
 (A) $u + \frac{at}{2}$ (B) $u + at$ (C) $u + 2at$ (D) $\frac{ut^2}{2} + \frac{at^3}{6}$
10. Differentiation of above result w.r.t. 't' will be -
 (A) a (B) $u + a$ (C) u (D) none

Answers Key

DPP NO. - 2

1. (B) 2. (A) 3. (C) 4. $4x^3 + 6x$
5. $5 + 21x^2$ 6. $\frac{2}{5}$ 7. $\frac{dy}{dx} = 1 + 2x - \frac{1}{x^2} - \frac{3}{x^4}$
8. $\frac{dy}{dx} = 2x - \frac{2}{x^3}$ 9. (B) 10. (A)

Hint & Solutions

DPP NO. - 2

1. $y = x^3 + 2x^2 + 7x + 8$

$$\frac{dy}{dx} = 3x^2 + 4x + 7$$

2. $y = 2x^2 + 3x$

$$\frac{dy}{dx} = 4x + 3$$

3. $y = -\frac{2}{3}x + \frac{5}{3} \Rightarrow \frac{dy}{dx} = -\frac{2}{3}$

Alter : $y = mx + c$
(slope) $m = -\frac{2}{3}$

4. $y = x^4 + 3x^2 + \pi + 2$; $\frac{dy}{dx} = 4x^3 + 6x$

$$5. \quad y = 4 + 5x + 7x^3 \quad ; \quad \frac{dy}{dx} = 5 + 21x^2$$

$$6. \quad y = \frac{2}{5}x + \frac{7}{5} \Rightarrow \frac{dy}{dx} = \frac{2}{5}$$

$$7. \quad y = x + x^2 + \frac{1}{x} + \frac{1}{x^3} \quad ; \quad \frac{dy}{dx} = 1 + 2x - \frac{1}{x^2} - \frac{3}{x^4} .$$

$$8. \quad y = x^2 + \frac{1}{x^2} . \quad \frac{dy}{dx} = 2x - \frac{2}{x^3}$$

$$9. \quad S = ut + \frac{1}{2}at^2$$

$$v = \frac{dS}{dt} = u + \frac{1}{2}a \times 2t = u + at$$

$$10. \quad \frac{dv}{dt} = a$$