RAVI MATHS TUITION CENTER, NEAR VILLIVAKKAM RLY STATION, CHENNAI – 82.
WHATSAPP - 8056206308

Differential Calculus - Differentiability and Methods of Differentiation 1

11th Standard

Maths

Time : 00:40:00 Hrs

Total Marks : 40

40 x 1 = 40

1) $\frac{d}{dx}(\frac{2}{\pi}sin\ x^o)$is
(a) $\frac{\pi}{180}cos\ x^o$**(b)** $\frac{1}{90}cos\ x^o$(c) $\frac{\pi}{90}cos\ x^o$(d) $\frac{2}{\pi}cos\ x^o$

2) If y = f(x^2+2) and f '(3) = 5,then $\frac{dy}{dx}$ at x = 1 is
(a) 5(b) 25(c) 15**(d) 10**

3) If y=$\frac{1}{4}u^4, u = \frac{2}{3}x^3 + 5,$ then $\frac{dy}{dx}$ is
(a) $\frac{1}{27}x^2(2x^3 + 15)^3$ (b) $\frac{2}{27}x(2x^3 + 5)^3$ **(c)** $\frac{2}{27}x^2(2x^3 + 15)^3$ (d) $-\frac{2}{27}x(2x^3 + 5)^3$

4) If f(x) = x^2 - 3x, then the points at which f(x) = f '(x) are
(a) both positive integers (b) both negative integers **(c) both irrational** (d) one rational and another irrational

5) If $y = \frac{1}{a-z}$,then $\frac{dz}{dy}$ is
(a) $(a - z)^2$ (b) -(z-a)^2(c) (z+a)^2(d) -(z+a)^2

6) If y=cos (sin x^2),then $\frac{dy}{dx}$ at x= $\sqrt{\frac{\pi}{2}}$ is
(a) -2(b) 2(c) $-2\sqrt{\frac{\pi}{2}}$**(d) 0**

7) If y = mx + c and f(0) =$f'(0) = 1$,then f(2) is
(a) 1(b) 2**(c) 3**(d) -3

8) If f(x) = x $\tan^{-1}$ x, then f '(1) is
(a) $1 + \frac{\pi}{4}$**(b)** $\frac{1}{2} + \frac{\pi}{4}$(c) $\frac{1}{2} - \frac{\pi}{4}$(d) 2

9) $\frac{d}{dx}(e^{x+5log\ x})$ is
(a) $e^x x^4$(x+5)(b) e^xx(x+5)(c) $e^x + \frac{5}{x}$(d) $e^x - \frac{5}{x}$

10) If the derivative of (ax - 5)e^{3x} at x=0 is -13, then the value of a is
(a) 8(b) -2(c) 5**(d) 2**

11) $x = \frac{1-t^2}{1+t^2}, y = \frac{2t}{1+t^2}$ then $\frac{dy}{dx}$is
(a) $-\frac{y}{x}$(b) $\frac{y}{x}$**(c)** $-\frac{x}{y}$(d) $\frac{x}{y}$

12) If x=a sin θ and y= b cos θ,then $\frac{d^2y}{dx^2}$is
(a) $\frac{a}{b^2}sec^2\theta$(b) $-\frac{b}{a}sec^2\theta$**(c)** $-\frac{b}{a^2}sec^3\theta$(d) $-\frac{b^2}{a^2}sec^3\theta$

13) The differential coefficient of $\log_{10}$ x with respect to $\log_x$10 is
(a) 1**(b) -($\log_{10}$ x)^2**(c) ($\log_x$ 10)^2

(d) $\frac{x^2}{100}$

14) If f(x) = x + 2, then f '(f(x)) at x = 4 is

(a) 8**(b) 1**(c) 4(d) 5

15) If $y = \frac{(1-x)^2}{x^2}$,then $\frac{dy}{dx}$ is

(a) 8(b) 1(c) 4**(d) 5**

16) If pv=81,then $\frac{dp}{dv}$ at v=9 is

(a) 1**(b) -1**(c) 2(d) -2

17) If $f(x) = \begin{cases} x-5 & \text{if } x \le 1 \\ 4x^2-9 & \text{if } 1 < x < 2 \\ 3x+4 & \text{if } x \ge 2 \end{cases}$,then the right hand derivative of f(x) at x = 2 is

(a) 0(b) 2**(c) 3**(d) 4

18) It is given that f '(a) exists, then $lim_{x \to a} \frac{xf(a)-af(x)}{x-a}$ is

(a) f(a) - af '(a)(b) f '(a)(c) - f '(a)(d) f(a) + af '(a)

19) If $f(x) = \begin{cases} x+1, & \text{when } x < 2 \\ 2x-1 & \text{when } x \ge 2 \end{cases}$,then f '(2) is

(a) 0(b) 1(c) 2**(d) does not exist**

20) If g(x)=(x^2+2x+3) f(x) and f(0)=5 and $lim_{x \to 0} \frac{f(x)-5}{x} = 4$,then g'(0) is

(a) 20**(b) 14**(c) 18(d) 12

21) If $f(x) = \begin{cases} x+2, & -1 < x < 3 \\ 5 & x = 3 \\ 8-x & x > 3 \end{cases}$,then at x=3, f '(x) is

(a) 1(b) -1(c) 0**(d) does not exist**

22) The derivative of f(x)=x|x| at x =−3 is

(a) 6(b) -6(c) does not exist(d) 0

23) If $f(x) = \begin{cases} 2a-x, & \text{for } -a < x < a \\ 3x-2a & \text{for } x \ge a \end{cases}$,then which one of the following is true?

(a) f(x)is not differentiable at x = a	(b) f(x) is discontinuous at x = a	(c) f(x) is continuous for all x in **R**	(d) f(x) is differentiable for all x $\ge$a

24) If $f(x) = \begin{cases} ax^2-b, & -1 < x < 1 \\ \frac{1}{|x|}, & \text{elsewhere} \end{cases}$ is differentiable at x = 1, then

(a) $a = \frac{1}{2}, b = \frac{-3}{2}$ (b) $a = \frac{-1}{2}, b = \frac{3}{2}$ **(c)** $a = -\frac{1}{2}, b = -\frac{3}{2}$ (d) $a = \frac{1}{2}, b = \frac{3}{2}$

25) The number of points in **R** in which the function $f(x) = |x-1| + |x-3| + sin\, x$ is not differentiable, is

(a) 3**(b) 2**(c) 1(d) 4

26) Choose the correct or the most suitable answer from the given four alternatives.

$Iff\,(x) = 4x^8, \quad then$

(a)	(b)	**(c)**	(d)
$f'\left(\frac{1}{2}\right) = f'\left(\frac{-1}{2}\right)$	$f\left(\frac{1}{2}\right) = -f'\left(\frac{-1}{2}\right)$	$f\left(\frac{1}{2}\right) = f\left(\frac{-1}{2}\right)$	$f\left(\frac{1}{2}\right) = f'\left(\frac{-1}{2}\right)$

27) Choose the correct or the most suitable answer from the given four alternatives.

$If \quad y = \sin^{-1} x + \cos^{-1} x$ then $\frac{dy}{dx}$ is

(a) 1(b) π(c) $\frac{\pi}{2}$**(d) 0**

28) Choose the correct or the most suitable answer from the given four alternatives.

If $y = \log_a x$ then $\frac{dy}{dx}$ is

(a) $\frac{1}{x}$**(b)** $\frac{1}{x \log_e a}$(c) $\log \frac{a}{e}$(d) $\frac{1}{\log_a x}$

29) Choose the correct or the most suitable answer from the given four alternatives.

If $f(x) = x + 1$, then $\frac{d}{dx}(f_0 f(x))$ is

(a) 1(b) 0(c) 2(d) x

30) Choose the correct or the most suitable answer from the given four alternatives.

$If \sin(x + y) = \log(x + y)$ then $\frac{dy}{dx}$ is

(a) 2(b) -2(c) 1**(d) -1**

31) Choose the correct or the most suitable answer from the given four alternatives.

For the curve $\sqrt{x} + \sqrt{y} = 1, \quad \frac{dy}{dx} at \left(\frac{1}{4}, \frac{1}{4}\right) is$

(a) $\frac{1}{2}$(b) 1**(c) -1**(d) 2

32) Choose the correct or the most suitable answer from the given four alternatives.

$If \quad y = \log\left(\frac{1-x^2}{1+x^2}\right) then \quad \frac{dy}{dx} \quad is$

(a) $\frac{4x^3}{1-x^4}$**(b)** $-\frac{4x}{1-x^4}$(c) $\frac{1}{4-x^4}$(d) $\frac{-4x^3}{1-x^4}$

33) Choose the correct or the most suitable answer from the given four alternatives.

If f(x) is an even functions, then f'(x) is an _____function

(a) even**(b) odd**(c) even and odd(d) even or odd

34) Choose the correct or the most suitable answer from the given four alternatives.

If f(x) is an odd function, then f'(x) is an _____ function

(a) even(b) odd(c) even or odd(d) neither even nor odd

35) Choose the correct or the most suitable answer from the given four alternatives.

$If \quad y = \sin^{-1}\left(\frac{1-x^2}{1+x^2}\right) then \quad \frac{dy}{dx}$ is

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

36) Choose the correct or the most suitable answer from the given four alternatives.

$If \quad x = a(\theta + \sin\theta), y = a(1 + \cos\theta) then \quad \frac{dy}{dx}$ is

(a) $\tan\frac{\theta}{2}$**(b)** $-\tan\frac{\theta}{2}$(c) $\cot\frac{\theta}{2}$(d) $-\cot\frac{\theta}{2}$

37) Choose the correct or the most suitable answer from the given four alternatives.

If, $y = a + bx^2$ where a, b are arbitrary constants, then

(a) $\frac{d^2y}{dx^2} = 2xy$**(b)** $x\frac{d^2y}{dx^2} = y_1$(c) $x\frac{d^2y}{dx^2} - \frac{dy}{dx} + y = 0$(d) $x\frac{d^2y}{dx^2} = 2xy$

38) Choose the correct statement

(a) Derivative of odd functionis odd (b) Derivative of even function is even (c) Inverse of odd function is odd **(d) Inverse function of sin x is $\sin^{-1}$ x**

39) Assertion (A):f (x) = $\begin{cases} x+1, & x < 2 \\ 2x-1, & x \geq 2 \end{cases}$ then f'(2) does not exist.

Reason (R) :f(x) is not continuous at 2.

(a) Both A and it are true and (b) Both A and R are true but **(c) A is** (d) A is

R is the correct explanation of A | R is not the correct explantion of A | **true R is false** | false R is true

40) Choose the incorrect pair

(a) 330^o - $\frac{11\pi}{6}$ radians **(b)** $\frac{7\pi^c}{3}$ **- 200^o** (c) 0^o - 0^c (d) $2\pi^c$ - 360^o