

Episode No – 27

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CALCULUS

Let f be differentiable $\forall x$, If $f(1) = -2$, $f'(x) \geq 2$, $\forall x \in [1, 6]$ then, $f(6)$ is always

- a) Greater than 0
- b) Greater than 2
- c) Greater than 6
- d) Greater than 8

Ans: d)

If m is slope of tgl to the curve $ey = 1+x^2$ then. $|m|$ is . . .

- a) > 1
- b) ≥ -1
- c) ≥ 1
- d) < 1

Ans :

The equation of tgl to curve $y = be^{-x/a}$ at the point where it crosses y-axis is

- a) $x/a - y/b = 1$
- b) $ax + by = 1$
- c) $ax - by = 1$
- d) $x/a + y/b = 1$

Ans : d)

$f(x) = |x| + |x-1| + |x-2|$ then . . . false statement is

- a) $f(x)$ has maxima at '1'
- b) $f(x)$ has maxima at '0'
- c) $f(x)$ has neither maxima nor minima at $x=0$
- d) $f(x)$ has neither maxima nor minima at $x=2$

Ans: c)

The line $ax+by+c=0$ is a normal to $xy=1$ then

- a) $x > 0$, $b > 0$
- b) $a > 0$, $b < 0$
- c) $a < 0$, $b < 0$
- d) $a > 0$, $b < 0$

Ans : b)

$f(x) = x + \cot^{-1}(x)$ increases in the internal

- a) \mathbb{R}
- b) \mathbb{R}^0
- c) \mathbb{R}^-
- d) $\mathbb{R} - \{0\}$

Ans : a)

$f(x) = \frac{x}{1+|x|}$ then $f^{-1}(-1)$ is

- a) $\frac{1}{4}$
- b) 0
- c) $\frac{-1}{2}$
- d) Does not exist

Ans : a)

$f(x)$ is odd differentiable function defined on \mathbb{R} such that $f^{-1}(3) = -2$, then $f^{-1}(-3) =$

- a) 2
- b) -2
- c) 0
- d) 4

Ans: b)

Let f be differentiable function satisfying $f(x^3) = x^5 \forall x \in \mathbb{R}$. then $3f^{-1}(8) =$

- a) 20
- b) 30
- c) 40
- d) 70

Ans : a)

Let f be polynomial function of second degree if $f(-1) = f(1)$ and a, b, c are in A.P. then $f^{-1}(a), f^{-1}(b), f^{-1}(c)$ are in,

- a) AP
- b) GP
- c) HP
- d) AGP

Ans : a)

$y = \frac{\sec x - \tan x}{\sec x + \tan x}$ then $\frac{dy}{dx}$ is

- a) $2\sec x[\sec x - \tan x]$
- b) $-2\sec x[\sec x + \tan x]^2$
- c) $-2\sec x[\sec x - \tan x]^2$

d) $2\sec x[\sec x + \tan x]^2$

Ans : c)

$y = \sin^{-1}[\sqrt{x^2 - x^3} + \sqrt{x - x^3}]$ and $y^1 = 0.5[\sqrt{x(1-x)}]^{-1} + P$ then ... 'P' is

a) 0

b) $(1-x)^{-\frac{1}{2}}$

c) $(1-x)^{-\frac{1}{2}}$

d) 0.5

Ans : b)

$y = \log x^2 e^{-x}$ then $x^2 y_2$ is

a) 0

b) -2

c) y

d) 1

Ans : b)

$\sin xy + \cos xy = 0$, then y^1 is

a) xy^{-1}

b) yx^{-1}

c) $-xy^{-1}$

d) $-y$

Ans : d)

$f^1(x) = \sqrt{2x^2 - 1}$ $y = f(x^2)$ then y^1 at $x=1$ is

a) 2

b) 1

c) -2

d) -1

Ans : a)