End term Q

U1 The three vectors V_1= (2.–1.2), V_2= (–2, 1, – 2), V_3 = (1, -2, -1) are

A. Linearly dependent
B. Linearly independent
C. Both(a) and (b)
D. None of these

U1 If two Eigen values of $\begin{bmatrix} 1 & 2 & 1 \\ 6 & -1 & 0 \\ -1 & -2 & -1 \end{bmatrix}$ are 3 and -4, then the third value is

A. 0
B. 1
C. -1
D. 2

U1 If every minor of order 3 of a matrix A is zero, then rank of A is

A. greater than 3
B. equal to 3
C. less than or equal to 3
D. less than 3

U1 The system of equations x - 3y + z = 2; x-4y + 2 = 0; 2y – z = 1 has

A. no solution
B. infinite many solution
C. unique solution
D. none of these

U2 If y log (sin (e^x)) then value of dy/dx is

A. $e^x \tan e^x$
B. $\frac{e^x}{\sin e^x}$
C. $e^x \cot e^x$
D. None of these

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U2 The value of integral $\int (x^2 + 1)\, e^x\, dx$ is

A. $(x^2 - x + 3) + c$
B. $(x^2 + x + 1) + c$
C. $(x^2 - 2x + 3) + c$
D. None of these

U2 The value of integral $\int 1/(e^x - 1)\,dx$ is

A. $x - e^{-x} + c$
B. $\log(1 - e^{-x}) + c$
C. $\log(e^x) - 1 + c$
D. None of these

U2 The value of dy/dx for $x^3 + x^2y + y^2 = 29$ is

A. $(3x^2+2xy)/(x^2+2y)$
B. $-(3x^2+2xy)/(x^2+2y)$
C. $(3x^2-2x^2y)/(x^2+2y)$
D. $(3x^2+2xy)/(x^2+2y^2)$

U3 Using Mean value theorem, the point c lying on the interval [2, 6] if $f(x)=(x-3)(x-6)$ is

A. 2
B. 4
C. 5
D. None of these

U3 lim $\lim_{x\to 1}$ log.x /(x-1)=

A. 0
B. -1
C. 1
D. None of these

U3 The value of lim $\lim_{x\to 0}$ (1/x - 1/sin x) is

A. 0
B. 1
C. 1/2
D. ∞

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U3 If the function $f(x) = x^4 - 62x^2 + ax + 9$ attains its maximum value at $x = 1$ in the interval [0.2] then the value of a is

A. 0
B. 100
C. 120
D. 128

U4 The maximum value of the function $f(x, y, z) = x^2 + y^2 + z^2$, where $lx + my + nz = p$ is

A. $l^2 + m^2 + n^2/p^2$
B. $p^2/l^2 + m^2 + n^2$
C. $3p^2/l^2 + m^2 + n^2$
D. $l^2 + m^2 + n^2/3p^2$

U4 If $Z = f(ax + by)$ then value of $b(\partial z/\partial x) - a(\partial z/\partial y)$ is

A. 1
B. Z
C. 0
D. None of these

U4 The stationary or critical point of function $f(x, y) = xy + 9/x + 3/y$ is

A. (1,1)
B. (1,0)
C. (3,1)
D. (1,3)

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U4 If $z = \tan^{-1}[(x^2 - y^2)/(x^2 + y^2)]$ then $x(\partial z/\partial x) + y(\partial z/\partial y)$ is

A. 2z
B. Z
C. 3z
D. 0

U4 If $u(x, y) = x^2\tan^{-1}(y/x) - y^2 \tan^{-1}(x/y)$, $x > 0$, $y > 0$,

Then $x^2 (\partial^2 u/\partial x^2) + 2xy (\partial^2 u/\partial x\partial y) + y^2 (\partial^2 u/\partial y^2)$ is equal to

A. 0
B. u
C. 2u
D. 3u

U4 if u = log $(x^2 + y^2 + z^2)$, then the value of $x\,u_x + y\,u_y + z\,u_z$ is equal to

A. 0

B. $2e^u$

C. 2u

D. 2

U4 If x=au , y= bv , z = cw, then Jacobian of (x, y, z) w.r.t (u, v, w)

A. 3abc

B. abc

C. $a^2b^2c^2$

D. abcuvw

U4 If $f(x, y)=x^2 e^{\frac{y}{x}}$ then f_x (1,1) is

A. $2e^{1/2}$

B. e

C. 2/e

D. $4\sqrt{e}$

U4 The value of $\underset{(x,y)\to(0,0)}{lt}$ x-y/$\sqrt{(x^2 + y^2)}$ is

A. 1/2

B. Does not exist

C. 1/4

D. None of these

U4 If f(x, y, z) = $(x^2 + y^2 + z^2)^{-12}$ then ,f_x(1.1.1) is

Q Ex If $f(x,y,z)=(x^2+y^2+z^2)^{-1/2}$ then $f_x(1,1,1)$ is

A. $1/(3)^{3/2}$

B. $1/(3)^{2/3}$

C. $-1/2(3)^{2/3}$

D. $-1/(3)^{3/2}$

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U4 If $f(x,y)=x+\begin{cases} \dfrac{xy^2}{x^2+y^2} & , (x,y)\neq(0,0) \\ 0 & , (x,y)=(0,0) \end{cases}$ then value of $f_x(0,0)$ is

A. 1
B. 2
C. 0
D. Does not exist

U4 If x + y + z = log z, then z_x is

A. z/(1+z)
B. (1-z)/z
C. z/(1-z)
D. (1+z)/z

U4 If $w=x^2y+2y$, $x=t^2$, y =log(t+1) then dw/dt at t=0 is

A. 1
B. 2
C. 3
D. 4

U4 If $w=x^2\,y^2$, $x=t^2$, $y=t^3$ then (dw/dt) at t=1 is

A. 9
B. 10
C. 20
D. 0

U5 Value of $\int_0 \int_0$

Value of $\displaystyle\int_0^{\pi}\int_0^{\sin\theta} dr\,d\theta$ is

A. 0
B. 1
C. 2
D. -2

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U5 Volume of one octant of sphere $x^2 + y^2 + z^2 = 1$ is given as

A. $\int_0^{\pi}\int_0^{1}\int_0^{\pi} r^2 \sin\theta \, d\theta \, dr \, d\varphi$

B. $\int_0^{1}\int_0^{\pi/2}\int_0^{\pi/2} r^2 \sin\theta \, dr \, d\theta \, d\varphi$

C. $\int_0^{1}\int_0^{\pi/4}\int_0^{\pi/2} r^2 \sin\varphi \, dr \, d\theta \, d\varphi$

D. None of these

U5 After changing the order of integration in $\int_0^{2}\int_{y=0}^{\frac{x^2}{2}} f(x,y)\, dy\, dx =$

A. $\int_{y=-2}^{2}\int_{x=\sqrt{2y}}^{0} f(x,y)\, dx\, dy$

B. $\int_{y=0}^{2}\int_{x=-\sqrt{2y}}^{\sqrt{2y}} f(x,y)\, dx\, dy$

C. $\int_{y=0}^{2}\int_{x=\sqrt{2y}}^{2} f(x,y)\, dx\, dy$

D. None of these

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U5 After changing the order of integration, that integral $\int_{-1}^{1}\int_{0}^{\sqrt{1-y^2}} f(x,y)$ f(x, y)dx dy is equal to

A. $\int_0^{1}\int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}} f(x,y)\, dy\, dx$

B. $\int_0^{1}\int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}} f(x,y)\, dy\, dx$

C. $\int_1^{0}\int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}} f(x,y)\, dy\, dx$

D. $\int_0^{1}\int_{0}^{\sqrt{1-x^2}} f(x,y)\, dy\, dx$

U5 if V is the volume bounded by $x^2 + y^2 + z^2 \le x$, then limit of r is

A. $0 \le r \le \sin\theta$
B. $0 \le r \le \cos\theta$
C. $0 \le r \le \sin\theta \sin\phi$
D. $0 \le r \le \sin\theta \cos\phi$

U5 If R is the region bounded by the circles

$x^2 + y^2 = 1$ and $x^2 + y^2 = 2$ then area in polar form is given as

A. $\int_0^{\pi/2}\int_1^2 r\,dr\,d\theta$
B. $\int_0^{\pi/4}\int_0^2 r\,dr\,d\theta$
C. $\int_0^{2\pi}\int_0^2 r\,dr\,d\theta$
D. $\int_0^{2\pi}\int_1^2 r\,dr\,d\theta$

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U5 Value of $\int_{x=0} \int_{y=0} (xy^2)$ dy dx is

A. 3/2
B. 9/4
C. 9/2
D. 3/4

U5 The area bounded by first quadrant of circle $x^2 + y^2 = 4$ is

A. π/2
B. π
C. π/4
D. 4π

U6 The value of $1+\cos 2n\pi$ when $n = 17$ is

A. 0
B. 1
C. 2
D. None of these

U6 In the Fourier series expansion of $f(x) = \begin{cases} x & , 0 < x < \pi \\ 0 & , \pi \le x \le 2\pi \end{cases}$ the value of Fourier coefficient a_1 is

A. $2/\pi$
B. 0
A. $-2/\pi$
B. None of these

U6 In the Fourier series expansion of $f(x) = \begin{cases} 1 & , -\pi < x < 0 \\ 0 & , 0 \le x \le \pi \end{cases}$ the value of Fourier coefficient a_1 is

A. $2/\pi$
B. 0
C. $-2/\pi$
D. none of these

The eigen values of $\begin{bmatrix} 1 & 2 \\ 3 & 0 \end{bmatrix}$ are

A. 2,3
B. -1,2
C. 3,-2
D. 4,-3

The value of integral $\int_0^{\pi/2}$ $\cos x/(\cos x + \sin x)\,dx$ is

A. $\pi/4$
B. $\pi/2$
C. π
D. 0

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The Taylor's series expansion of log(1+x) is

A. $x+\frac{x^3}{3}+\frac{2}{15}x^5+---$

B. $x-\frac{x^3}{3}+\frac{2}{15}x^5+---$

C. $x-\frac{x^2}{2}+\frac{x^3}{3}-\frac{x^4}{4}+---$

D. $-x-\frac{x^2}{2}-\frac{x^3}{3}-\frac{x^4}{4}+---$

If u (x, y) = $\sqrt{(x^2 + y^2)}\ \mathrm{Cos}^{-1}(y/x)$ then it is

A. homogeneous function of degree 1
B. homogeneous function of degree 2
C. homogeneous function of degree 0
D. not homogeneous function

If Z = f (ax + by) then value of b(ðz/ðx)- a(ðz/ðy) is

A. 1
B. Z
C. 0
D. None of these

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The area bounded by cylinder $x^2 + y^2 =1$, $0 \le z \le 4$ is

A. $\int_0^4\int_0^1\int_0^{\sqrt{1-x^2}} dydxdz$

B. $\int_0^4\int_{-1}^1\int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}} dydxdz$

C. $\int_0^4\int_0^{\sqrt{1-y^2}}\int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}} dydxdz$

D. $\int_0^4\int_0^1\int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}} dydxdz$

Cylindrical polar form of dy dx dz is

$$\text{Cylindrical polar form of } \int_0^1\int_{-1}^{1}\int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}} dy\,dx\,dz \text{ is}$$

A. $\int_0^{2\pi}\int_0^1\int_0^1 r\,dr\,dz\,d\theta$

B. $\int_0^{2\pi}\int_0^2\int_{-1}^1 r\,dr\,dz\,d\theta$

C. $\int_0^2\int_{-\pi}^{\pi}\int_0^1 r\,dr\,d\theta\,dz$

D. $\int_0^2\int_0^{\frac{\pi}{2}}\int_0^1 r\,dr\,d\theta\,dz$

Polar form of the integral ($x^2 + y^2$) dy dx is

$$\text{Polar form of the integral } \int_{-1}^{1}\int_0^{\sqrt{1-x^2}}(x^2+y^2)\,dy\,dx \text{ is}$$

A. $\int_0^1\int_0^r r^3\,d\theta\,dr$

B. $\int_0^{2\pi}\int_0^1 r^2\,dr\,d\theta$

C. $\int_0^{\pi}\int_0^1 r^3\,dr\,d\theta$

D. $\int_0^{\pi}\int_0^1 r^2\,dr\,d\theta$

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The area bounded by the lunes Dy the lines x = 0, y = 0 and x + y = 1 is given as

A. 1/2
B. -1/2
C. 3/2
D. -3/2

The value of $\int_0^1 \int_0^x \int_0^{x+y} dz\,dy\,dx$ is

A. 1/8
B. 1/3
C. 1/2
D. 1/6

In Fourier half range cosine series expansion for the periodic function $f(x)=x + x^2$, $0<x<l$, the value of Euler's coefficient a_0 is

A. 5/3
B. 10/3
C. 3/5
D. none of these

In half range Sine series of $f(x) = 1$, $0<x<2$, the value of Fourier coefficient b_2, is

A. 4
B. 2
C. 0
D. 1/2

In the Fourier series expansion of $f(s) = \sqrt{[(1- \cos x)]}$, $0 < x < 2\pi$, the value function coefficient a_0 is

A. 1/4
B. $\pi/4$
C. 0
D. $4/\pi$

The Fourier coefficient, a_0 of the Fourier series for

A. 1
B. $\pi/4$
C. π
D. 2π

In half range Sine series of $f(x)=1$, $0 < x < 2$, the value of Fourier coefficient b, is

A. 4
B. 2
C. 0
D. ½

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In the Fourier series expansion of $f(x) = \begin{cases} x & , 0 < x < \pi \\ 0 & , \pi \le x \le 2\pi \end{cases}$, the value of Fourier coefficient b_1 is

A. 0
B. $2/\pi$
C. 1
D. None of there

In half range Sine series of $f(x) = \begin{cases} x & , 0 < x < 1 \\ 1 & , 1 \le x < 2 \\ 3-x & , 2 \le x < 3 \end{cases}$, the value of Fourier coefficient a_0, is

A. 2/3
B. 4/3
C. 1/3
D. None of these

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In the Fourier series expansion of $f(x) = x^2$, $-\pi \le x \le \pi$, the value of Fourier coefficient a_0 is

A. 0
B. 8/3
C. 2/3
D. 1/2

In the Fourier series expansion of $f(x) = 1-2x$, $-\pi \le x \le \pi$, the value of Fourier coefficient a_0 is

A. 1/4
B. 2
C. 0
D.

The area bounded by the lines x = 0, y = 0 and x + y = 1 is given as

A. 1/2
B. -1/2
C.

Mid Term

U2 The derivative of function y = tan(e^4x) w.r.t x is e^{4x}

A. -e^4x / (1+4e^4x)
B. e^4x / (1+ e^4x)
C. 4e^4x / (1+ e^4x)
D. e^4x / (1+ 4e^4x)

U2 The value of integral $\int_0^1 \sqrt{\frac{1-x}{1+x}}\,dx$ is

A. 1
B. -1
C. (π/2)+1
D. (π/2)-1

The value of

The value of $\frac{d}{dx}\left(\sqrt{\frac{x^2+1}{x^2-1}}\right)$ is

A. $\frac{2x}{(x^2-1)^{3/2}\sqrt{x^2+1}}$
B. $\frac{x}{(x^2-1)^{1/2}\sqrt{x^2+1}}$
C. $-\frac{2}{(x^2-1)^{1/2}\sqrt{x^2+1}}$
D. $\frac{x^2}{(x^2-1)\sqrt{x^2+1}}$

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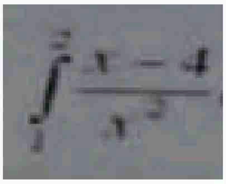
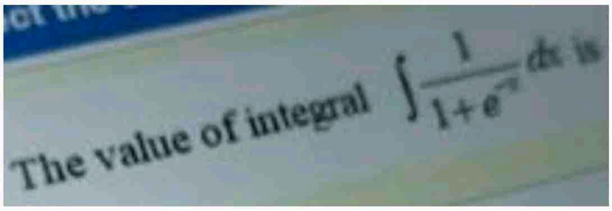
U2 The value of integral $\int_1^2 (x-4)/x^2$ is



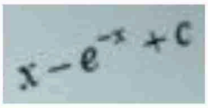
$$\int_1^2 \frac{x-4}{x^2}$$

A. Log 2 +2x
B. Log 2 +2
C. Log 2 -1
D. None of these

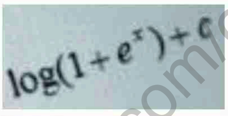
U2 The value of integral $\int$ 1/(1+e^¯x) dx is



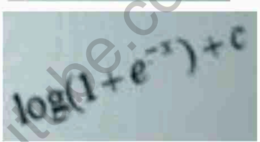
The value of integral $\int \frac{1}{1+e^{-x}} dx$ is

A. X - e^¯x +c A 

$x - e^{-x} + c$

B. Log(1+ e^x) +c B 

$\log(1+e^{x})+c$

C. Log(1+ e^¯x) +c C 

$\log(1+e^{-x})+c$

D. None of these

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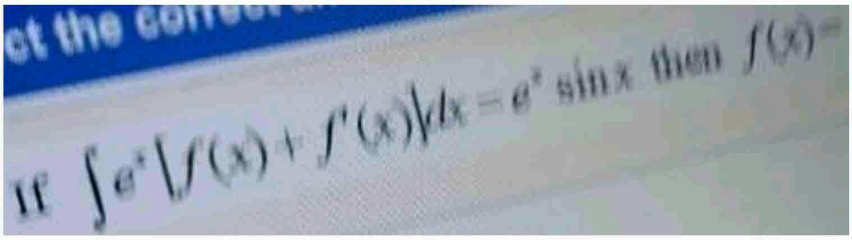
U2 If $\int$e^x [f(x) + f ‘(x)]dx=e^x sinx then f(x)=



If $\int e^x [f(x) + f'(x)] dx = e^x \sin x$ then $f(x)=$

A. Cos x
B. Sinx
C. -cosx
D. -sinx

U2 If x=2cos3t, y = 3sin2t then dy/dx is

A. -cos2t/sin3t
B. -sin2t/cos3t
C. -tan3t
D. Cot3t

U2 Partial fractions of $(x - 4)/(x^2 + 2x - 15)$ are

A. 9/(x+5) – 1/(x-3)
B. 9/(x-5) – 1/(x-3)
C. -1/4(x+5) + 1/2(x+3)
D. 1/8[9/(x+5) – 1/(x-3)]

The value of ∫ x/(x+2)(x-1) dx =

A. $\frac{1}{4}\ln|x+2|+\frac{3}{4}\ln|x-1|+c$
B. $\frac{1}{3}\ln|x+2|-\frac{2}{3}\ln|x-1|+c$
C. $\frac{2}{3}\ln|x+2|+\frac{1}{3}\ln|x-1|+c$
D. None of these

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The value of $\int_0^{\pi}$ sin4xcos12xdx is

A. 100/84
B. 16/81
C. 0 ans

U2 The value of dy/dx for $x^4 – 2y^2 = 3xy$ is

A. $(4x^2+3y)/(3x+4y)$
B. $(4x^2-3y)/(3x+4y^2)$
C. $(4x^3+3y)/(3x-4y)$
D. $(4x^3-3y)/(3x+4y)$

U2 ∫1/xlogx dx =

A. Log x
B. Log(log x)
C. Log(1/log x)
D. 1/logx

If 1, 2 & 3 are the eigen values of $\begin{bmatrix} 2 & 0 & 1 \\ 0 & 2 & 0 \\ x & 6 & 2 \end{bmatrix}$ then the value of x is

A. 0
B. 1
C. 2
D. 3

The matrix $\begin{bmatrix} 1 & 1+2i & 2+i \\ 1-2i & 2 & 1-2i \\ 2-i & 1+2i & 5 \end{bmatrix}$ is

A. symmetric
B. skew- symmetric
C. hermitian
D. skew-hermitian

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U1 If A = $\begin{bmatrix} 1 & 2 & 3 \\ 0 & 3 & -1 \\ 0 & 0 & -2 \end{bmatrix}$ then the eigen values of $3A^3+5A^2-6A-2i$ are

A. 5, -6, 2
B. 1, 3, -2
C. 3, 5, 6
D. 4, 110, 10

The product of the Eigen values of $\begin{bmatrix} 1 & 2 & 7 \\ 0 & 3 & 2 \\ 0 & 0 & 4 \end{bmatrix}$ is

A. 15
B.

U1 If the Characteristic equation of the matrix A of order 3x3 is $\lambda^2 - 4\lambda^2 + 5\lambda - 1 = 0$ then by Cayley Hamilton Theorem A^{-1} is equal to

A. 1/2 (A^2 -4A - i)
B. A^2 - 4A + 5i
C. A^2 - 6A - 8i
D. None of these

In given system of linear equations AX=B, A is square matrix of order n

If rank (A)=rank (A/B) < number of unknowns then the system is,

A. Inconsistent & system has no solution
B. Consistent & system has infinite solutions
C. Consistent & system has unique solution
D. None of the above

If $\begin{bmatrix} x+2 & y+x \\ z-3 & 2w-3 \end{bmatrix} = \begin{bmatrix} 0 & 6 \\ 2 & 1 \end{bmatrix}$ then values of x,y,z and w are

A. x = -2, y = -8, z = 4 and w = 3
B. x = -1, y = -6, z = 3 and w = 2
C.

U1 The product of the Eigen values of $\begin{bmatrix} 1 & 2 & 7 \\ 0 & 3 & 2 \\ 0 & 0 & 4 \end{bmatrix}$ is

A. 15
B. 12
C. 10
D. None of these

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The product of two eigen values of the matrix $\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$ is 16 then the third eigenvalue is

A. 2 ans

Lim(1/x)^tan x =

$$\lim_{x\to 0}\left(\frac{1}{x}\right)^{\tan x}$$ =

A. 0
B. 1
C. e
D. none of these

The function f(x) = e^x has

A. one minimum value
B. one maximum value
C. neither maximum nor minimum value
D. one maximum and one minimum value

U3 The Maclaurin's expansion of f(x)=1/(1+x²) is

A. $\sum_{n=0}^{\infty}(-1)^{n-1}x^{2n}$

B. $\sum_{n=0}^{\infty}x^{2n}$

C.

U3 The stationary points of $x^3 - 48x + 7$ on the interval [0.5] are

A. x = 2, X = 4
B. x=-4, x=4
C. only x = 4
D. none of these

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U3 To which of the following interval roll's theorem is applicable for $f(x)= x(x-2)^2$

A. [0,2]
B. [-2,2]
C. [0,3]
D. [0,4]

U3 The value of $\lim_{x\to 2}$ [$\sqrt{}$(x+2)-2]/(x-2) is

A. 0
B. 1/4
C. 1/2
D. 1

U3 Which of the following functions will have only odd powers of x in its Taylor's series expansion about the point x=0?

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A. $\sin(x^2)$
B. $\sin(x^3)$
C. $\cos(x^3)$
D. $\cos(x^2)$

U3 The series $\sum_{n=0}^{\infty}(-1)^n \frac{x^{2n}}{(2n)!}4^n$ is a Maclaurin's series for the function........

The series $\sum_{n=0}^{\infty}(-1)^n \frac{x^{2n}}{(2n)!}4^n$ is a Maclaurin's series for the function....

A. cosx
B. cos2x
C. sinx
D. sin2x

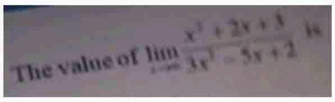
U3 The value of c $\in$ (1,2) if $f(x)=x^3$ is continuous over interval [1, 2] and differentiable over interval (1, 2) is

A. 0
B. 1
C. 2
D. Cannot find c as roll's theorem is not applicable

U2 The value of dy/dx for $y = \log[1-\sqrt{(1+x^2)}]$ is

A. $x/[1-\sqrt{(1+x^2)}]$
B. $x/[(1+x^2)-\sqrt{(1+x^2)}]$
C. $1/[(1+x^2)-\sqrt{(1+x^2)}]$
D. None of these

U3 The value of $\lim_{x\to\infty} (x^2+2x+3)/(3x^3-5x+2)$ is


The value of $\lim_{x\to\infty} \frac{x^2+2x+3}{3x^3-5x+2}$ is

A. 0
B. 3/2
C. 1/3
D. None of these

youtube.com/c/SauravHathi