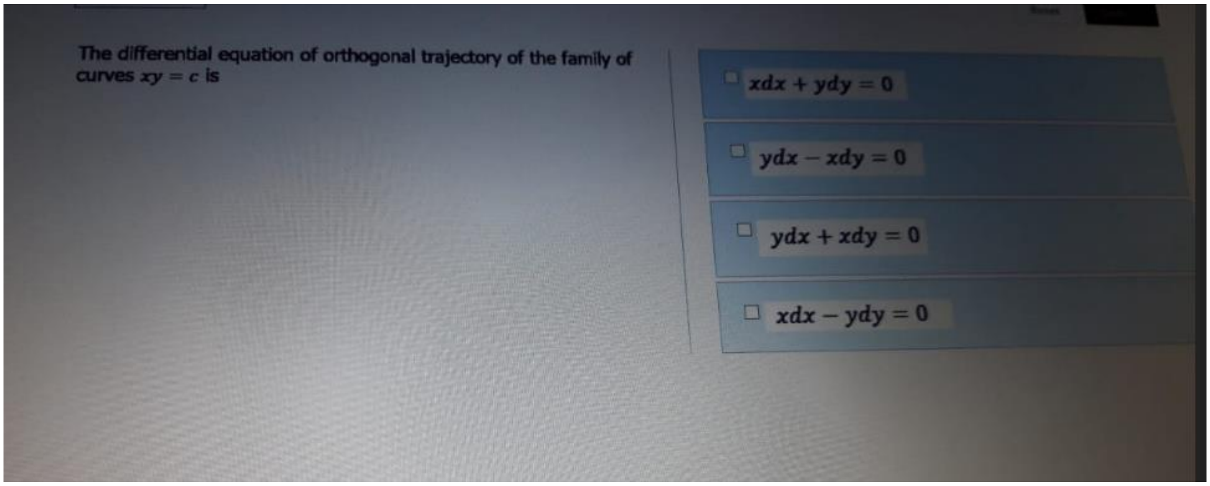
Unit: 1 (34 Questions)

Unit:1 The differential equation of orthogonal trajectory of family of curves xy=c is

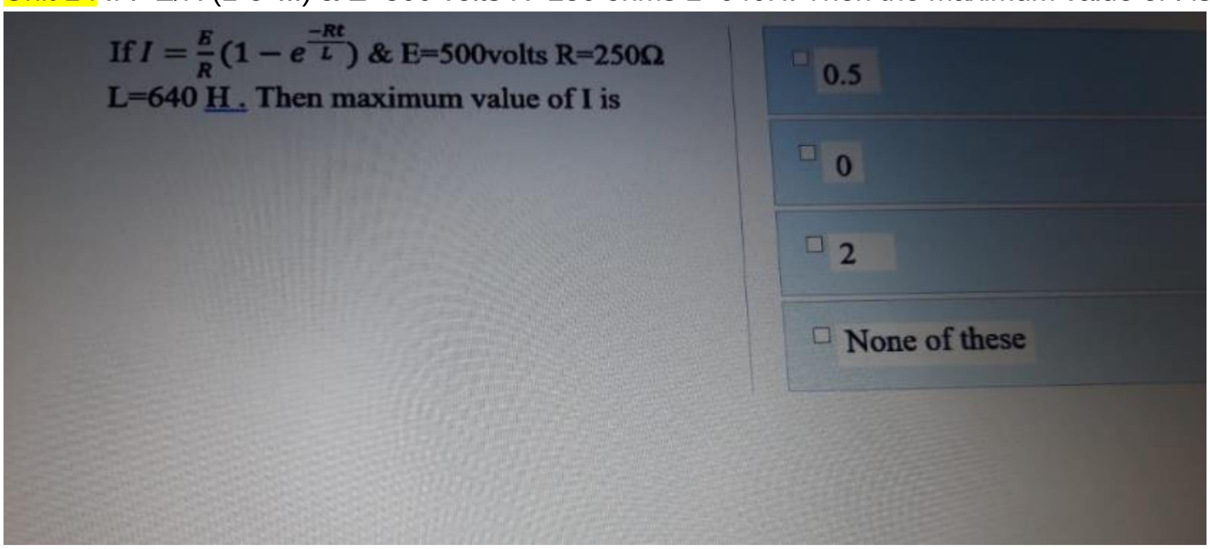


The differential equation of orthogonal trajectory of the family of curves $xy = c$ is

- $xdx + ydy = 0$
- $ydx - xdy = 0$
- $ydx + xdy = 0$
- $xdx - ydy = 0$

Ans:D (xdx-ydy=0)

Unit 1 : If I=E/R (1-e^...) & E=500 volts R=250 ohms L=640H. Then the maximum value of I is

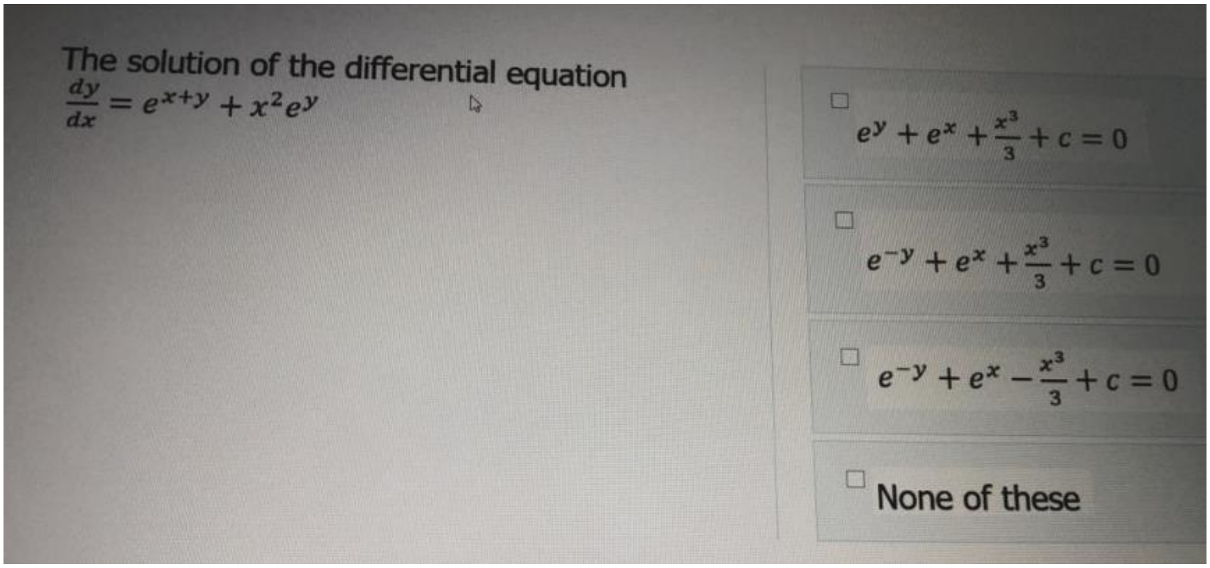


If $I = \frac{E}{R}(1 - e^{\frac{-Rt}{L}})$ & E=500volts R=250Ω L=640 H. Then maximum value of I is

- 0.5
- 0
- 2
- None of these

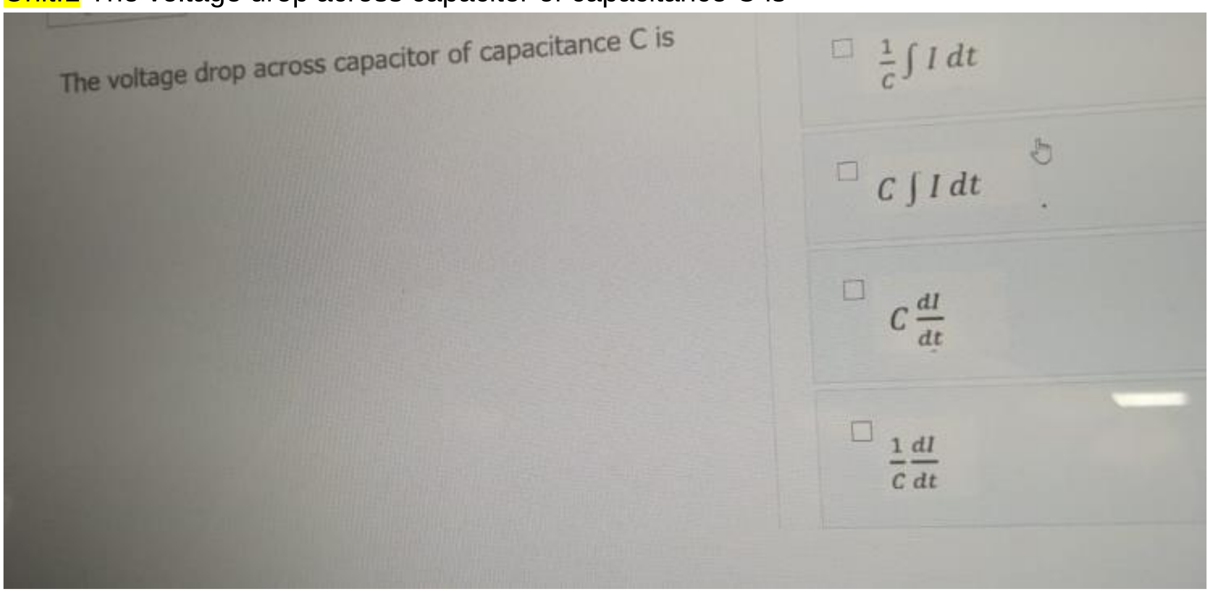
Ans:c (=2)

Unit 1: The solution of the differential equation: $dy/dx=e^{x+y}+x^2e^y$



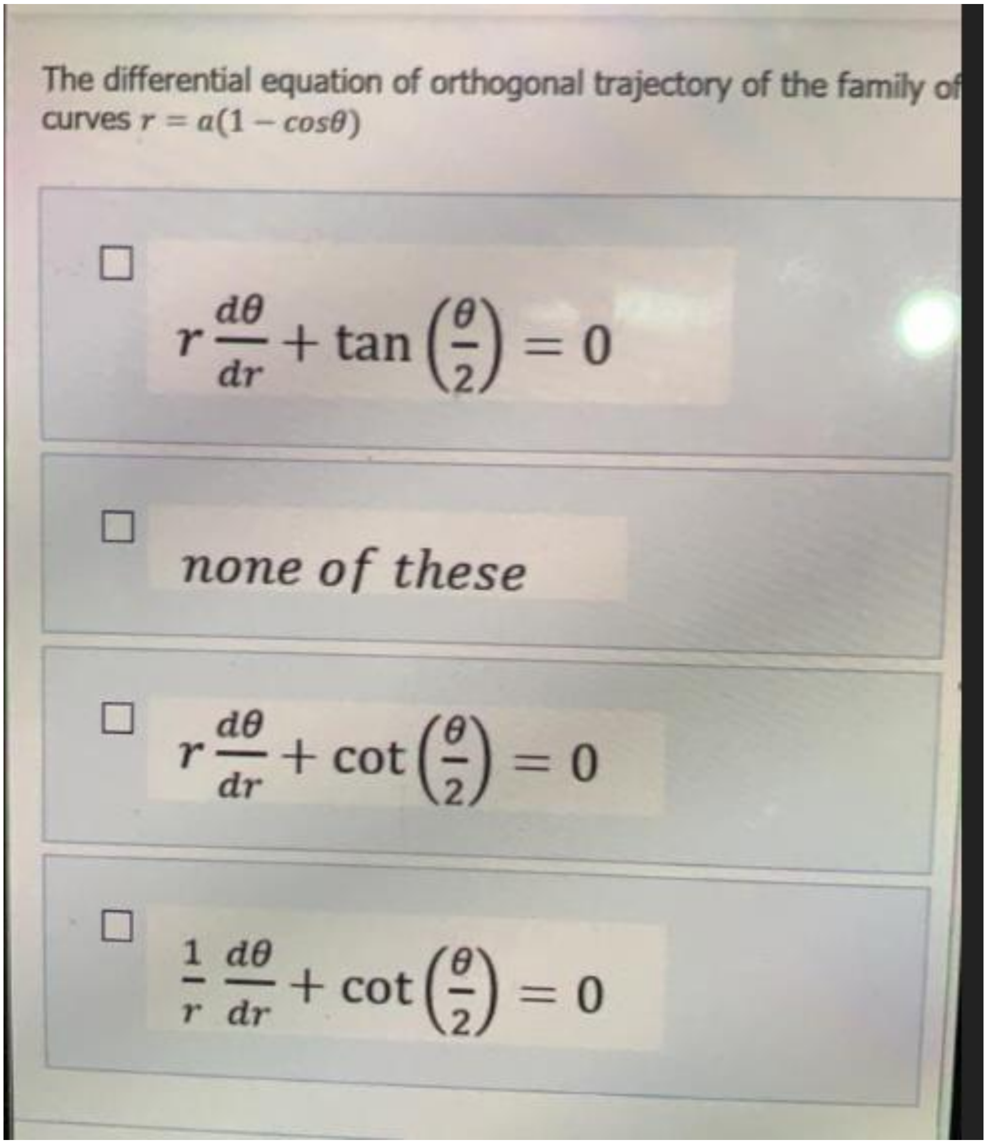
Ans:B

Unit:1 The voltage drop across capacitor of capacitance C is



Ans: A [1/C integral(I dt)]

Unit:1 The differential equation of orthogonal trajectory of the family of curves r=a(1-cos theta)

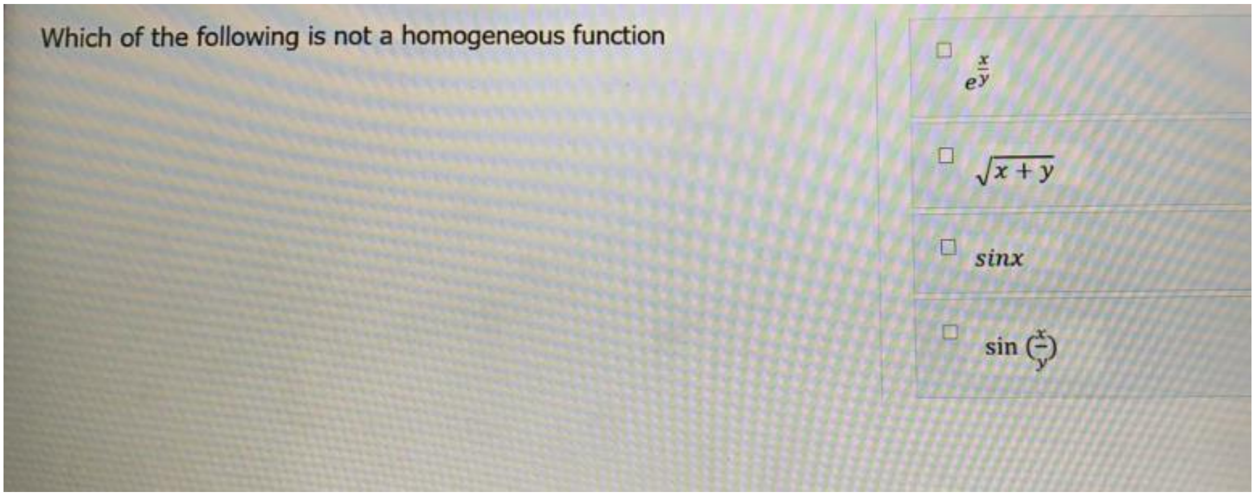


The differential equation of orthogonal trajectory of the family of curves $r = a(1 - cos\theta)$

- [ ] $r\frac{d\theta}{dr} + \tan\left(\frac{\theta}{2}\right) = 0$
- [ ] $none\ of\ these$
- [ ] $r\frac{d\theta}{dr} + \cot\left(\frac{\theta}{2}\right) = 0$
- [ ] $\frac{1}{r}\frac{d\theta}{dr} + \cot\left(\frac{\theta}{2}\right) = 0$

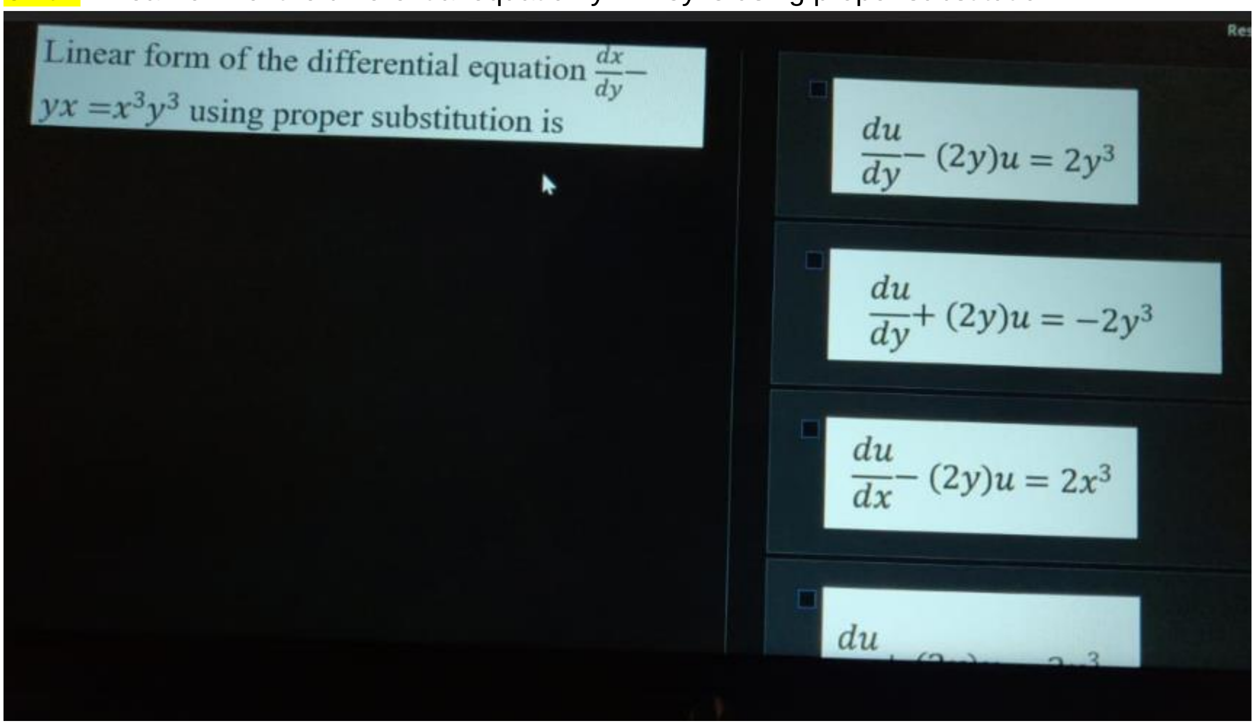
Ans: option C : r(dtheta/dr) + cot(theta/2)

Unit 1: Which of these is not a homogeneous function



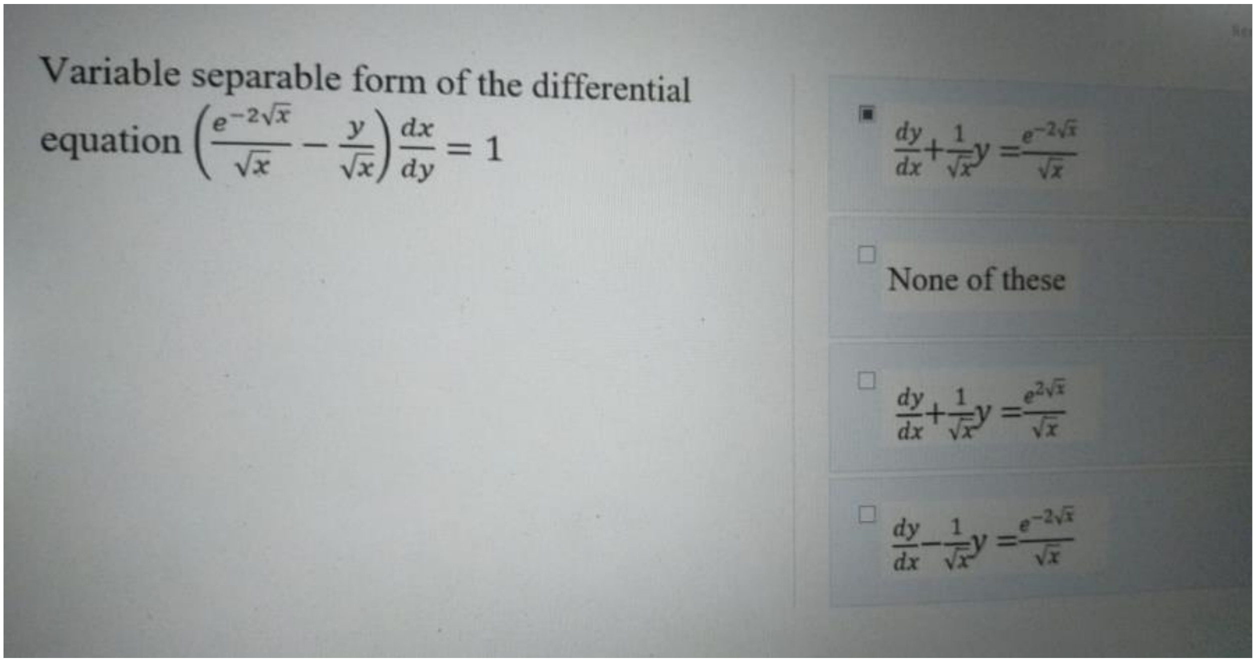
Ans: Sin X

Unit:1 Linear form of the differential equation yx=x^3y^3 using proper substitution



Ans:B du/dy + (2y)u=-2Y^3

UNIT 1:Variable separable form of the differential equation

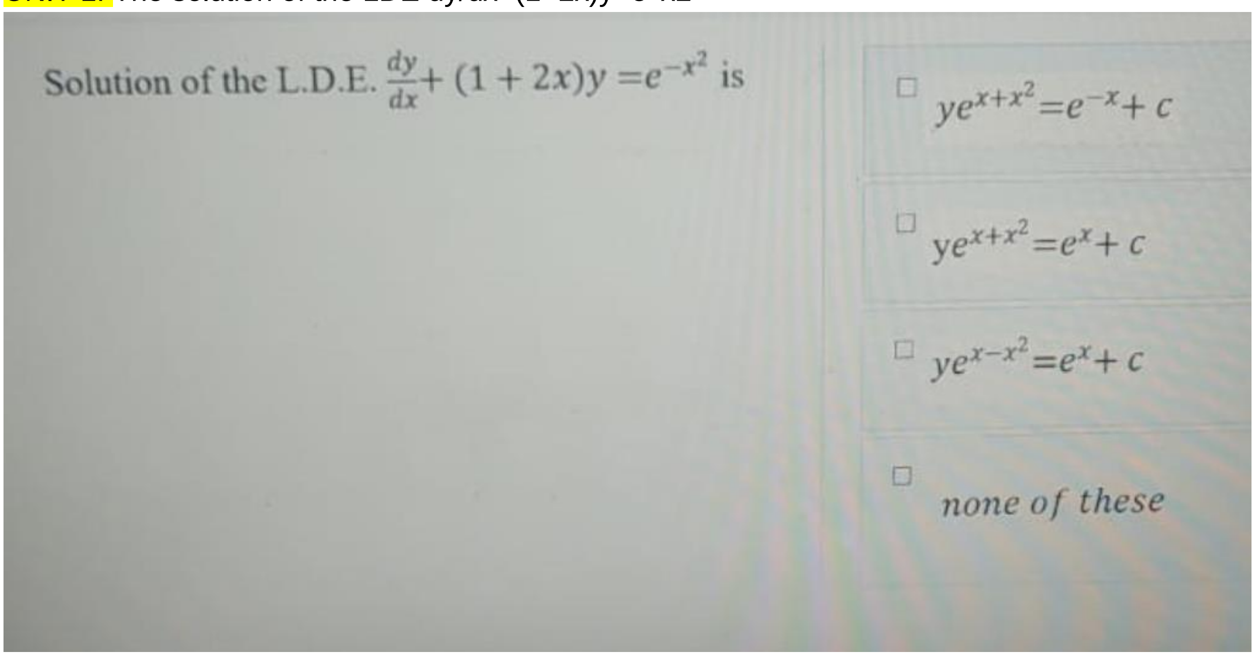


Variable separable form of the differential equation $\left(\frac{e^{-2\sqrt{x}}}{\sqrt{x}} - \frac{y}{\sqrt{x}}\right)\frac{dx}{dy} = 1$

- $\frac{dy}{dx}+\frac{1}{\sqrt{x}}y = \frac{e^{-2\sqrt{x}}}{\sqrt{x}}$
- None of these
- $\frac{dy}{dx}+\frac{1}{\sqrt{x}}y = \frac{e^{2\sqrt{x}}}{\sqrt{x}}$
- $\frac{dy}{dx}-\frac{1}{\sqrt{x}}y = \frac{e^{-2\sqrt{x}}}{\sqrt{x}}$

sAns: A (none of these if wanna go for variable separable form of the eq)

UNIT 1: The solution of the LDE dy/dx+(1+2x)y=e^x2

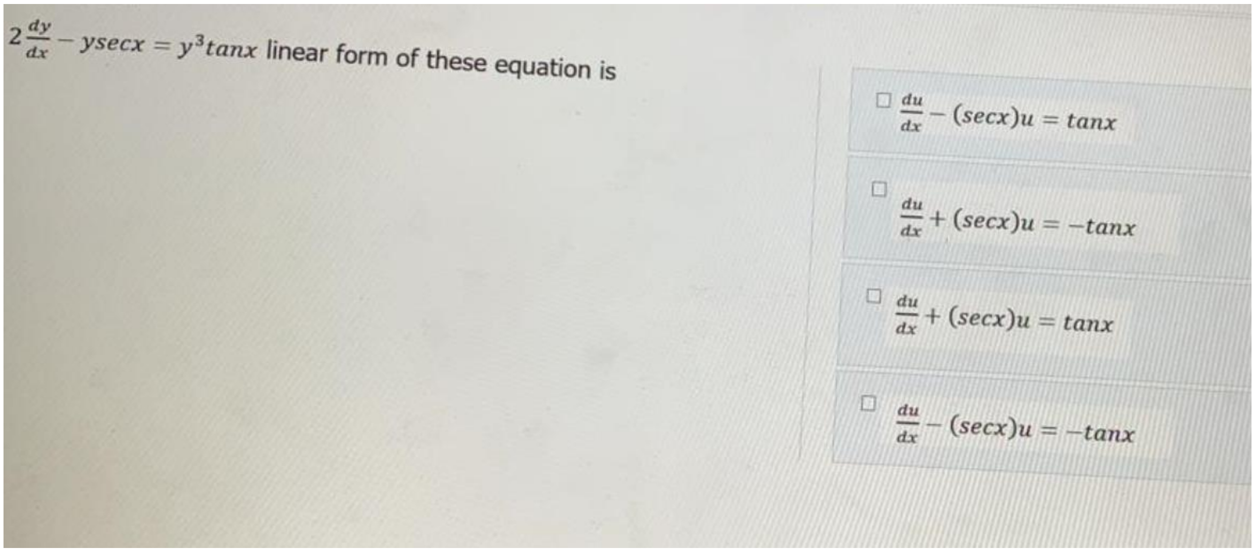


Solution of the L.D.E. $\frac{dy}{dx}+ (1 + 2x)y = e^{-x^2}$ is

- $ye^{x+x^2} = e^{-x} + c$
- $ye^{x+x^2} = e^{x} + c$
- $ye^{x-x^2} = e^{x} + c$
- *none of these*

Ans: B

Unit:1 2dy/dx - ysecx=y^3 tanx Linear form of these equation is

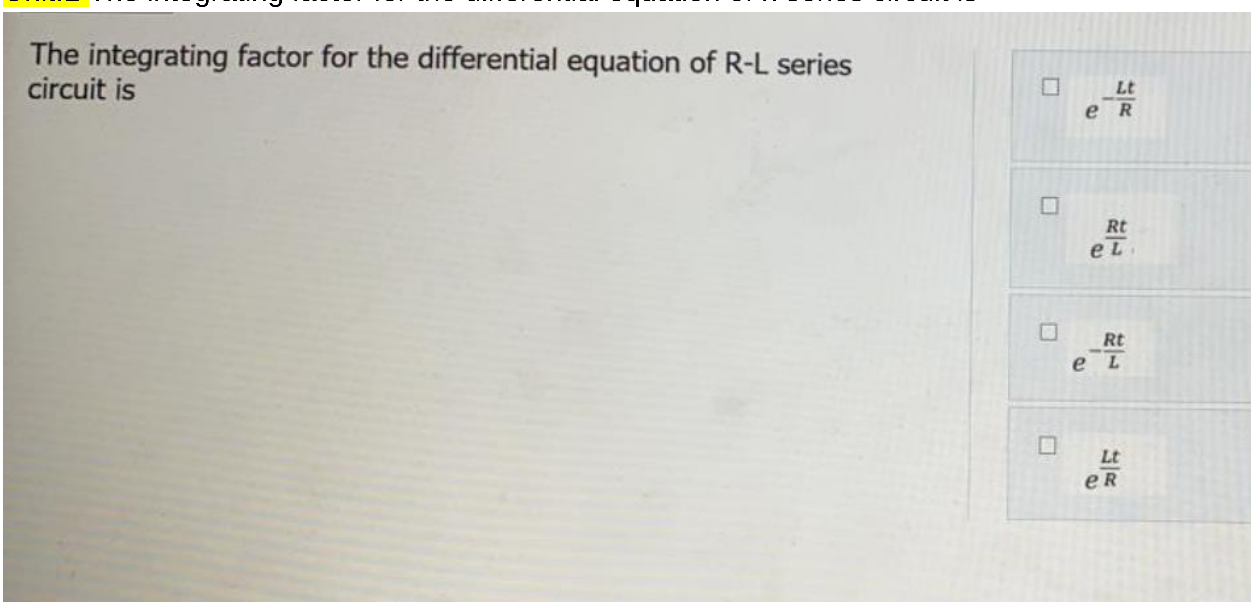


$2\frac{dy}{dx} - ysecx = y^3tanx$ linear form of these equation is

- $\frac{du}{dx} - (secx)u = tanx$
- $\frac{du}{dx} + (secx)u = -tanx$
- $\frac{du}{dx} + (secx)u = tanx$
- $\frac{du}{dx} - (secx)u = -tanx$

Ans: B

Unit:1 The integrating factor for the differential equation of rl series circuit is

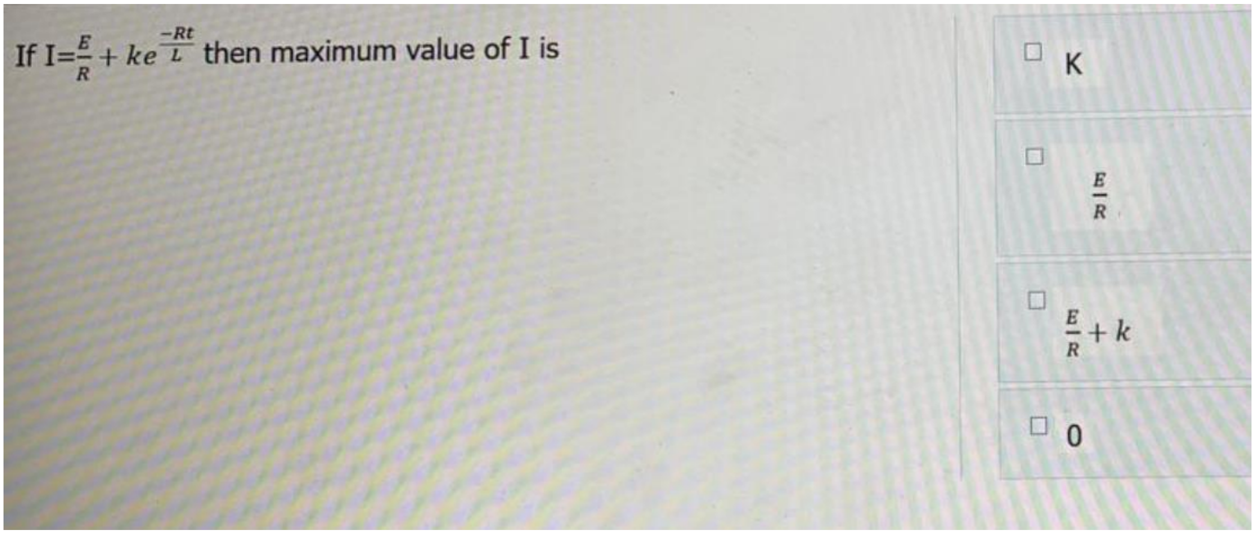


The integrating factor for the differential equation of R-L series circuit is

- $e^{-\frac{Lt}{R}}$
- $e^{\frac{Rt}{L}}$
- $e^{-\frac{Rt}{L}}$
- $e^{\frac{Lt}{R}}$

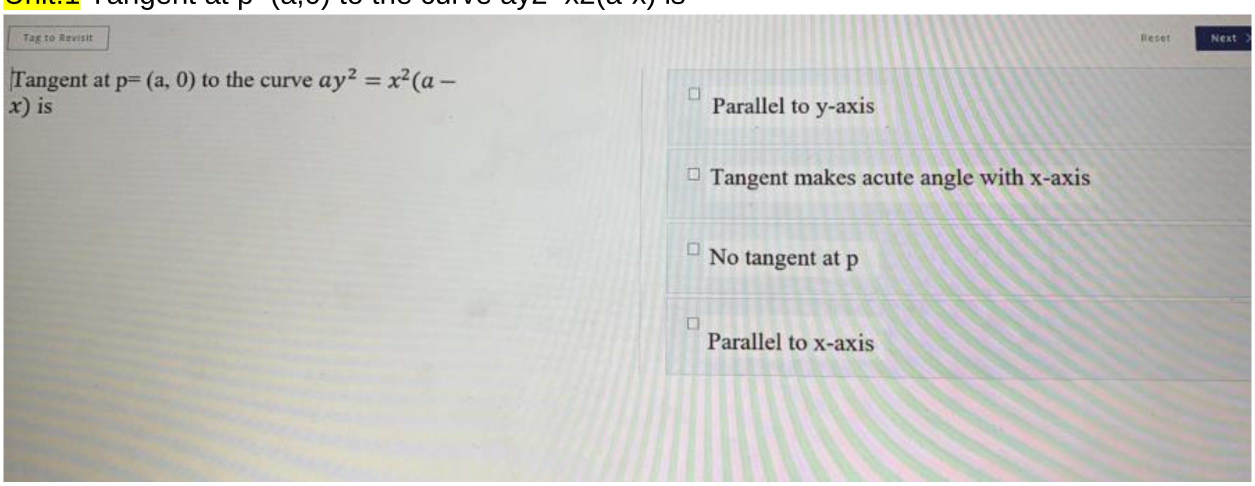
Ans:B e^RT/L

Unit:1: If I=e/r+ke^-rt/l then maximum value of I is



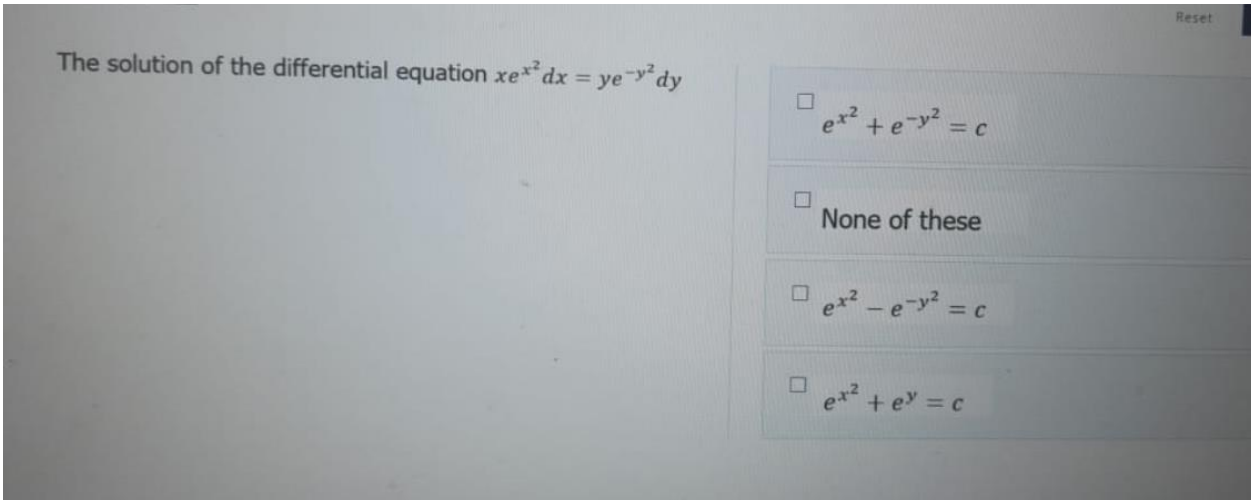
Ans:B(E/R)

Unit:1 Tangent at p=(a,0) to the curve ay2=x2(a-x) is



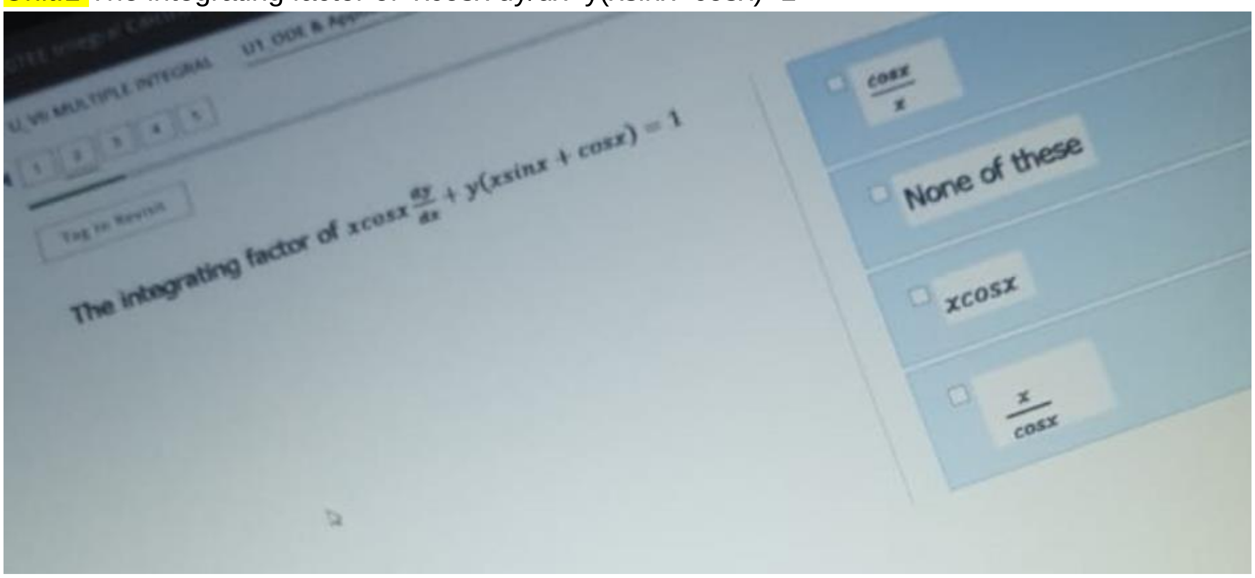
Ans:A (parallel to y axis)

Unit:1 The solution of the differential equation xe^x2.dx=y.e^y2.dy



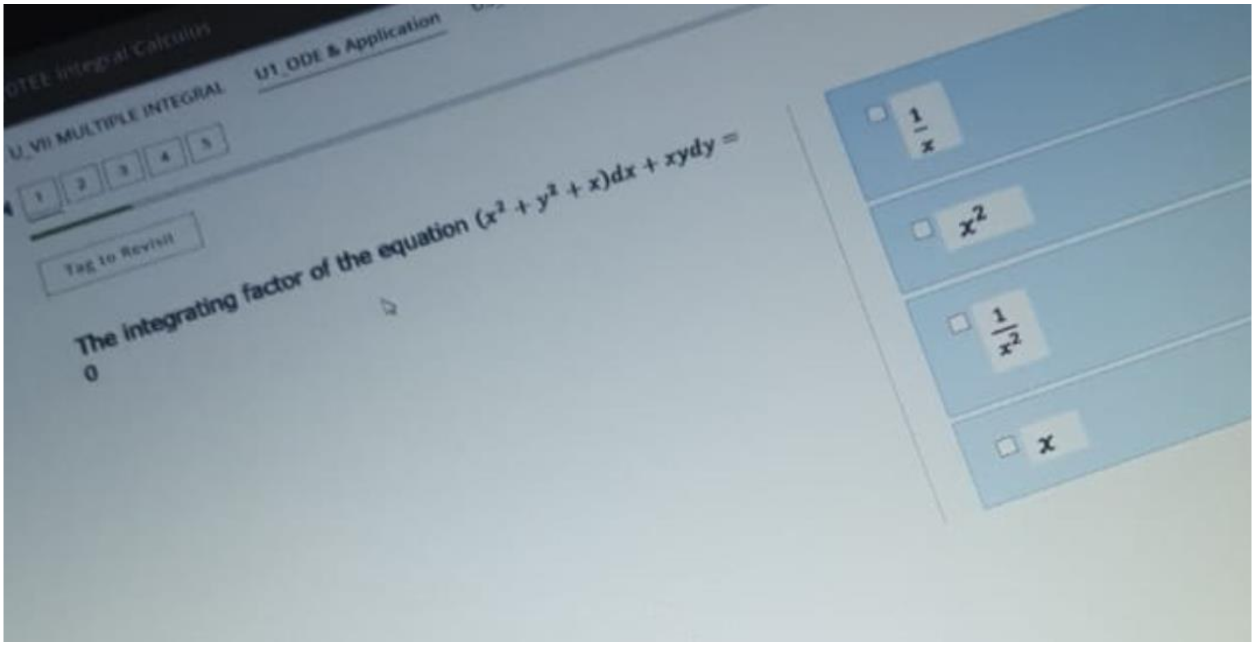
Ans:A

Unit:1 The integrating factor of xcosx dy/dx+y(xsinx+cosx)=1



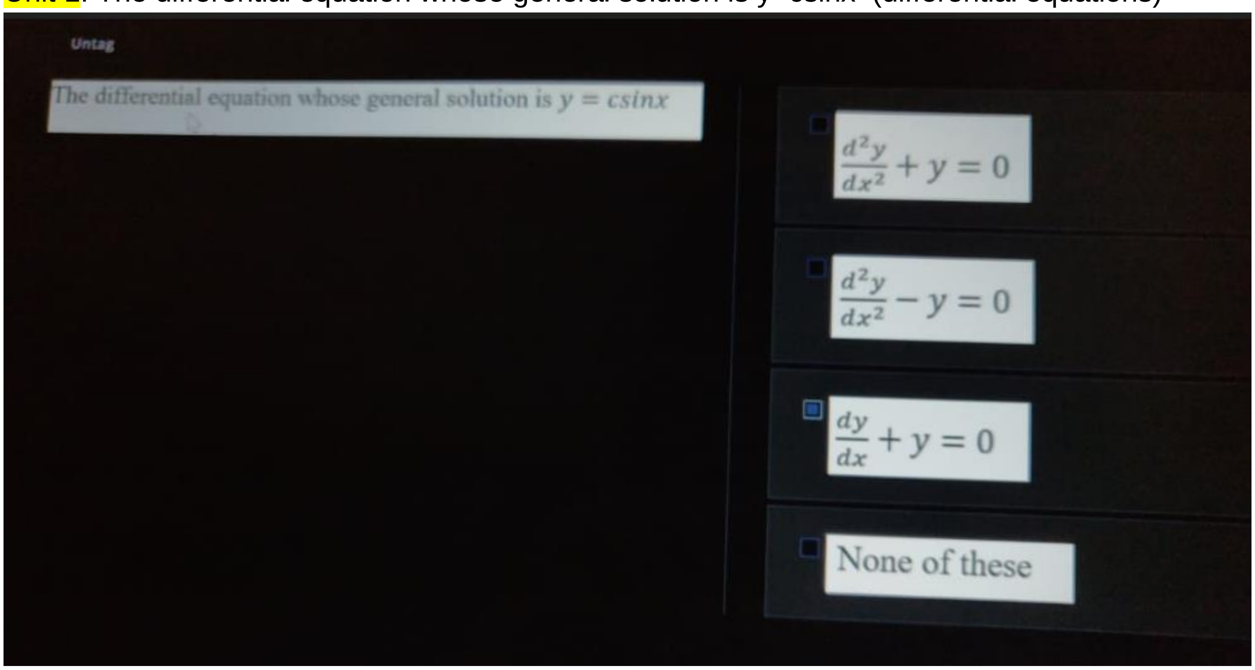
Ans:d

Unit:1 The integrating factor of equation (x^2+y^2+x)dx+xydy=0



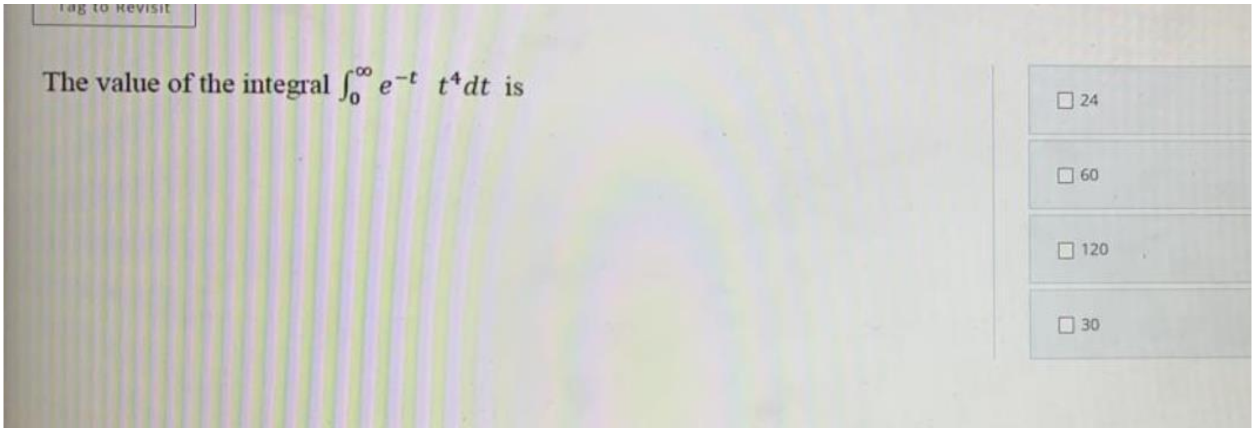
Ans: x (check just in case)

Unit 1: The differential equation whose general solution is y=csinx (differential equations)



Ans: a

UNIT 1 The value of the integral e^-t t^4dt is



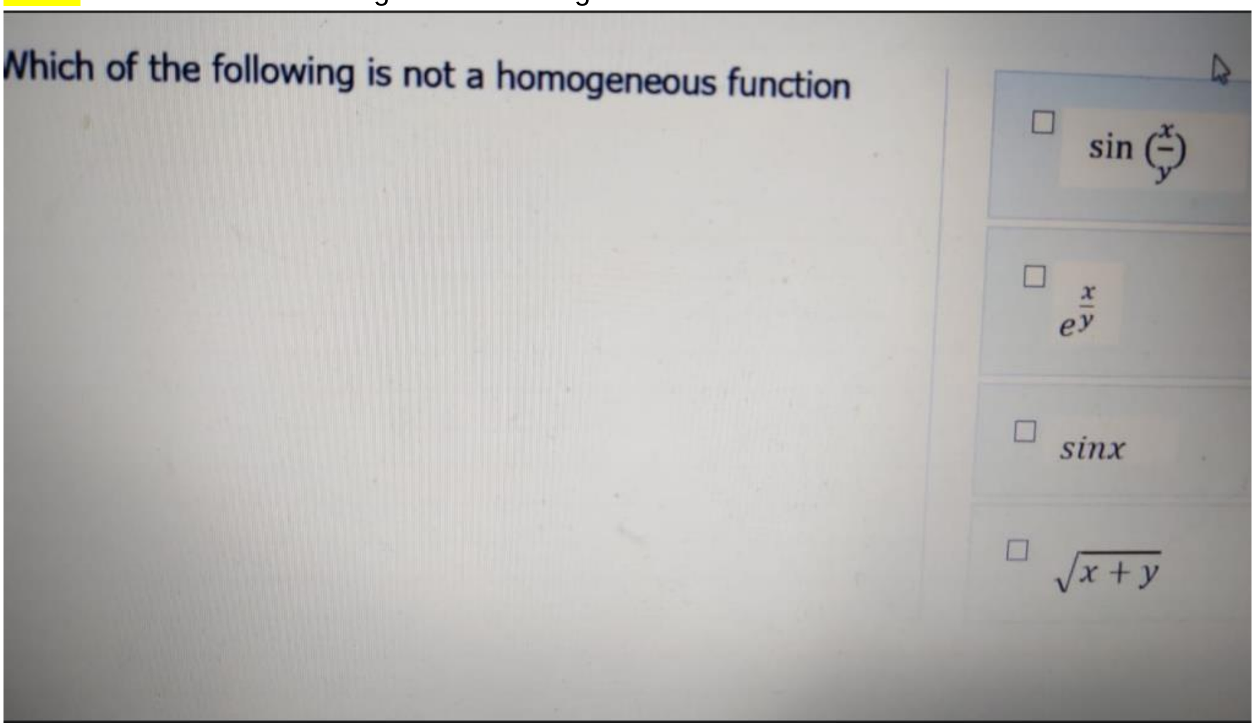
Tag to Revisit

The value of the integral $\int_0^{\infty} e^{-t} \; t^4 dt$ is

- ☐ 24
- ☐ 60
- ☐ 120
- ☐ 30

Ans: 24

Unit 1 : Which of the following is not a homogeneous function

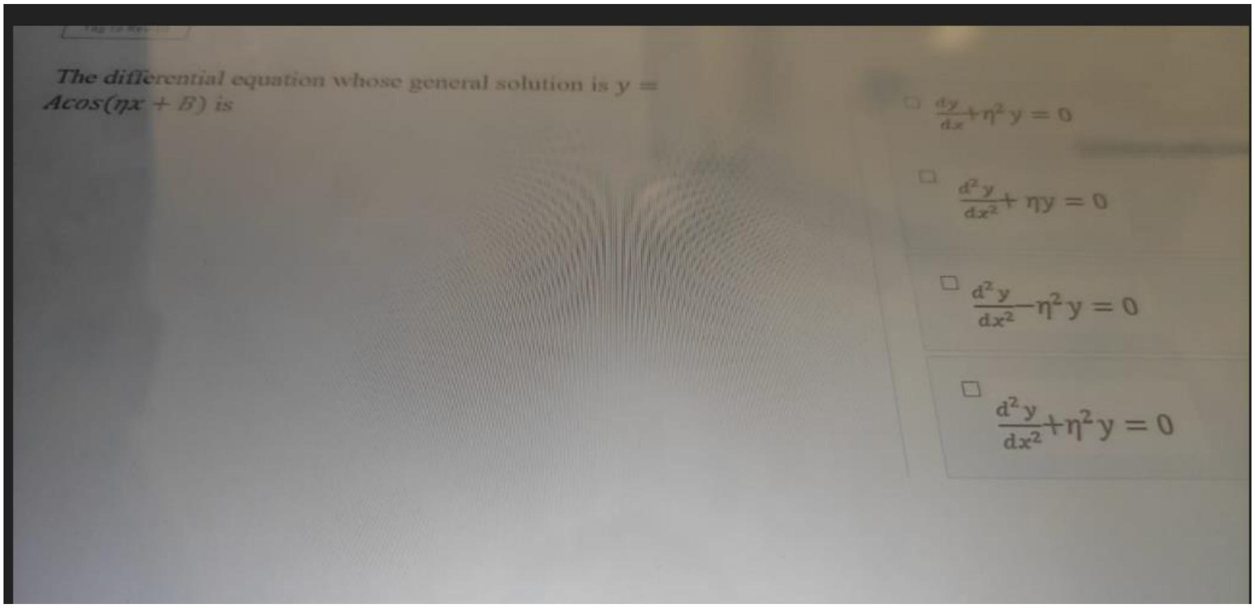


Which of the following is not a homogeneous function

- ☐ $\sin\left(\frac{x}{y}\right)$
- ☐ $e^{\frac{x}{y}}$
- ☐ $sinx$
- ☐ $\sqrt{x+y}$

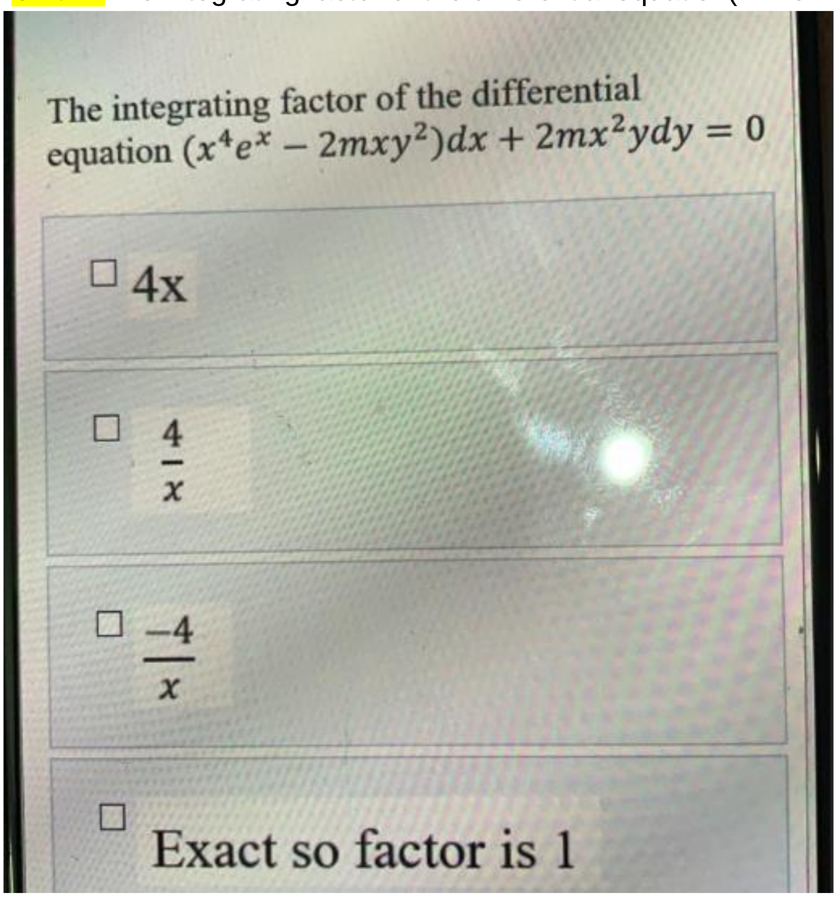
Ans : sin x

Unit 1 :The differential equation whose general solution is y=Acos(nx+B) is



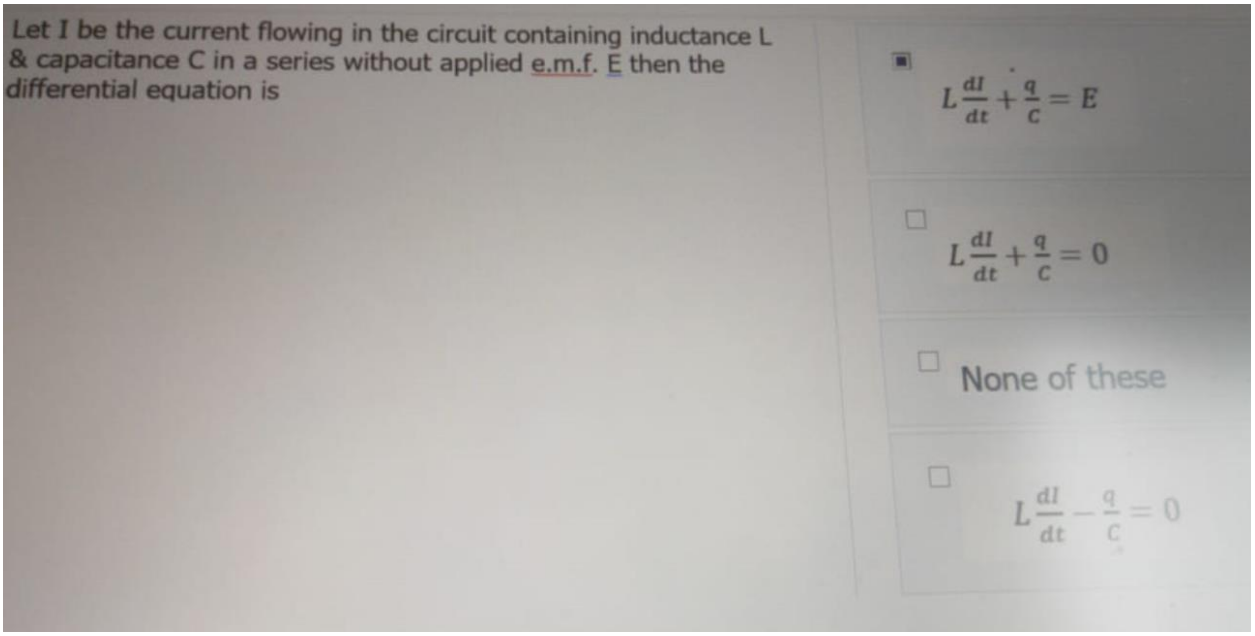
Ans:C

Unit: 1 The integrating factor of the differential equation(x^4e^x-2mxy)dx



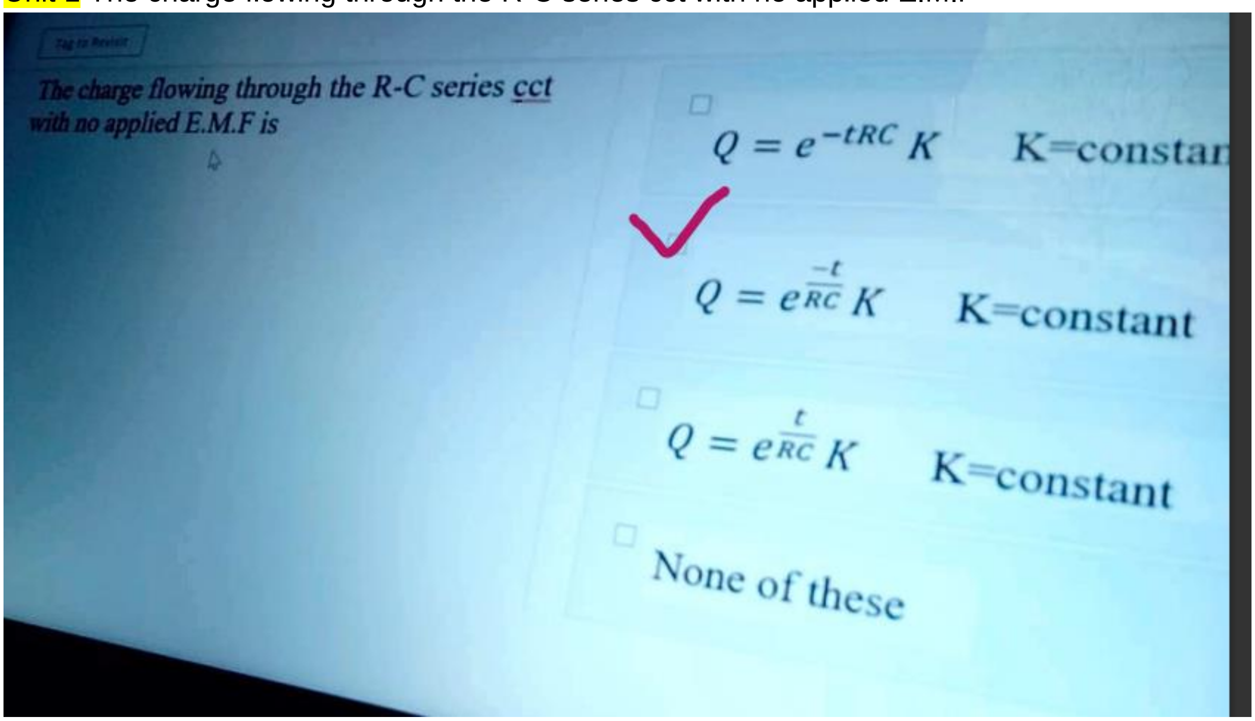
Ans:

Unit 1 Let I be the current flowing in the circuit containing inductance



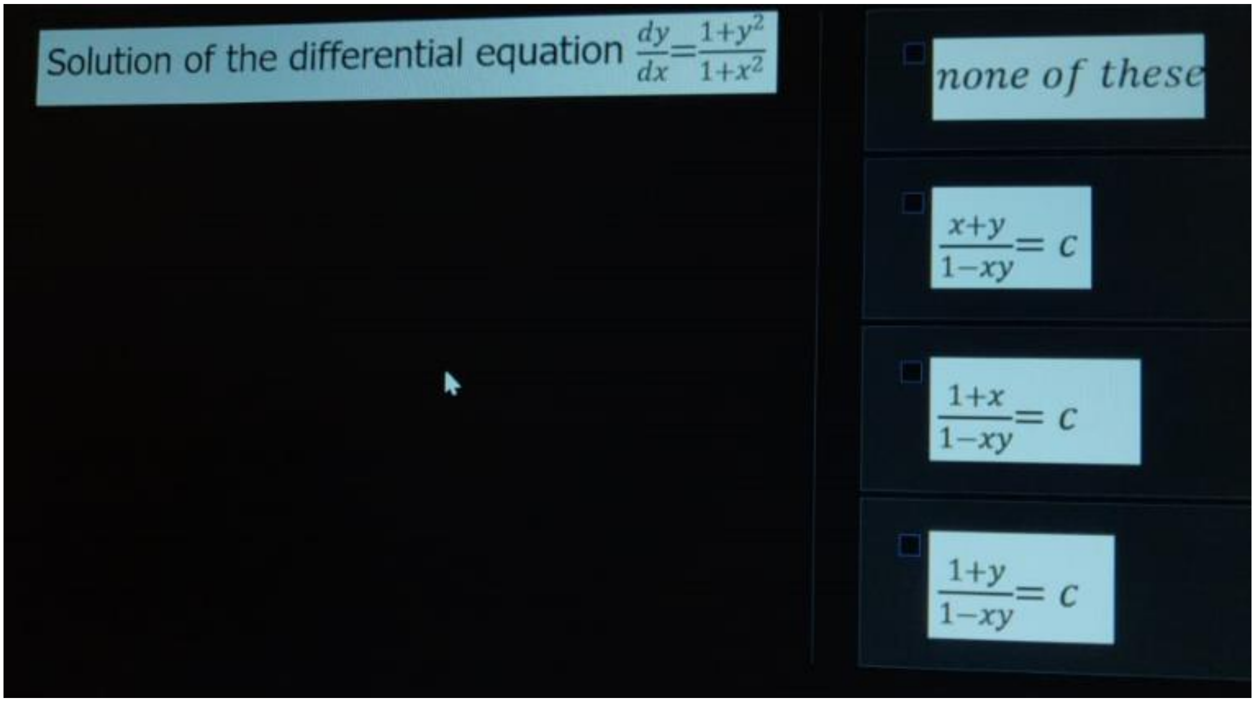
Ans: B

Unit 1 The charge flowing through the R-C series cct with no applied E.M.F



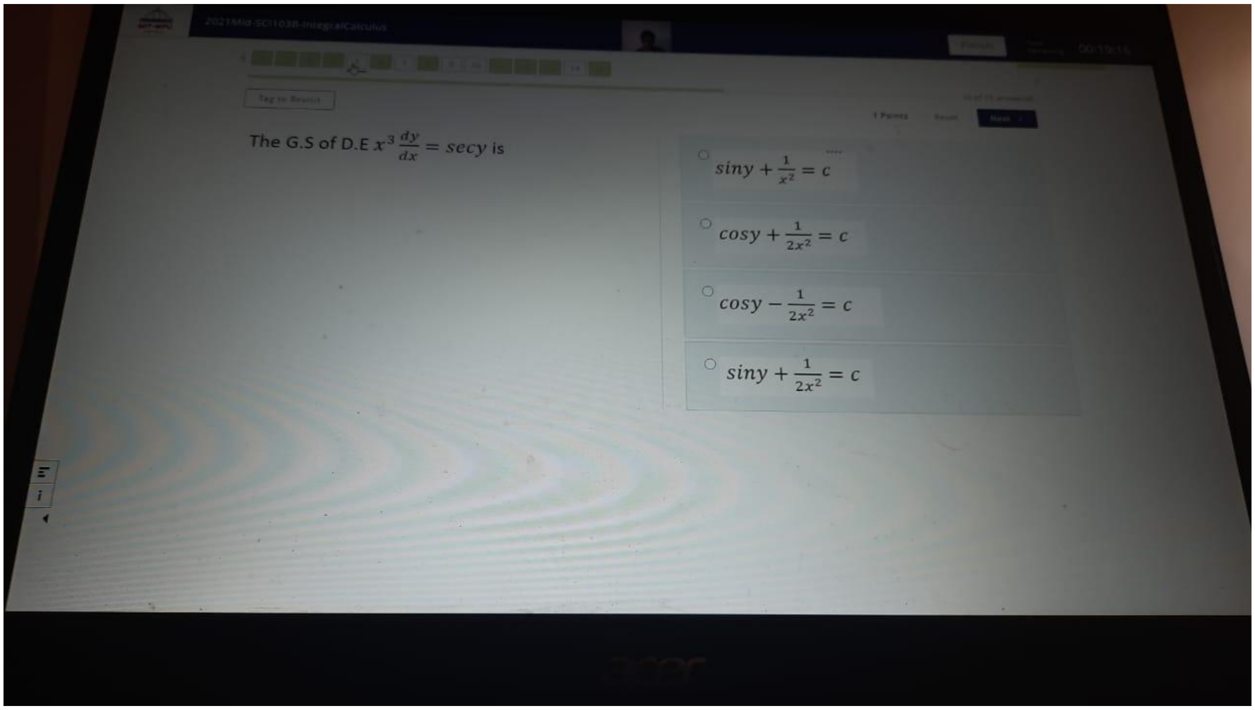
Ans: B

Unit 1 : Solution of the differential equation dy/dx=1+y^2/1+x^2



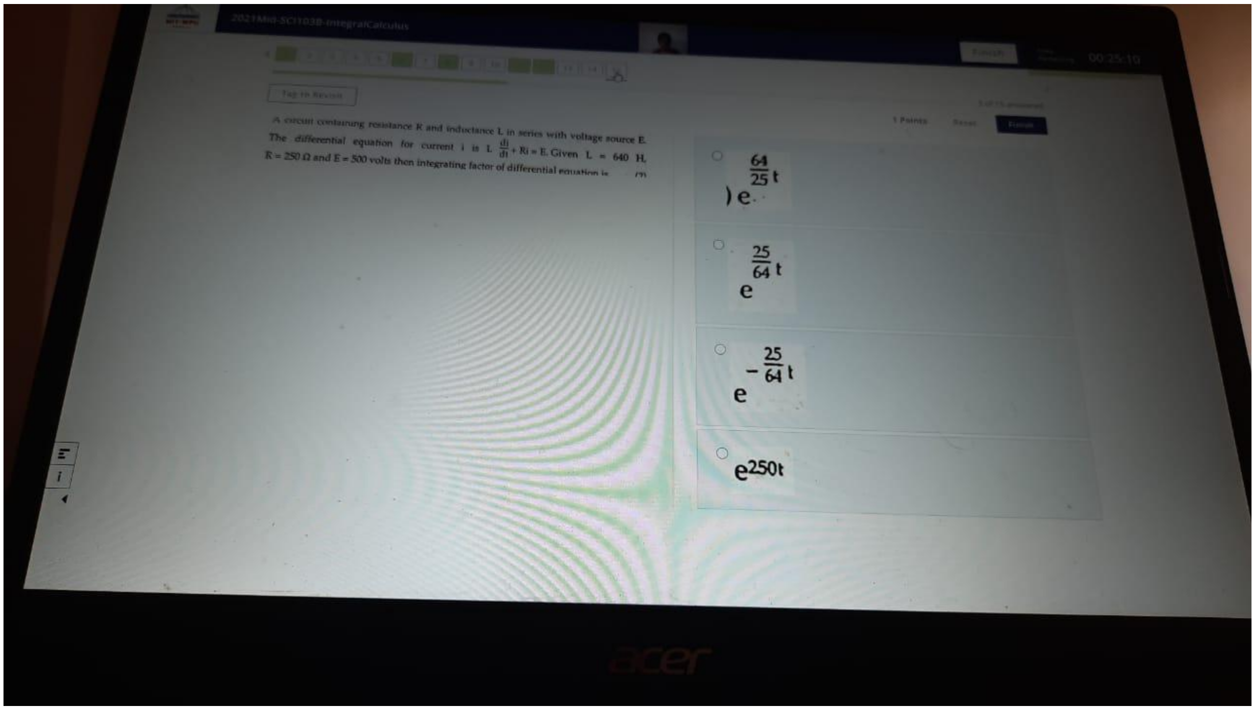
Ans: none of these (ans- $\left[\frac{y-x}{1+yx}\right]$

Unit 1 : The G.S of D.E



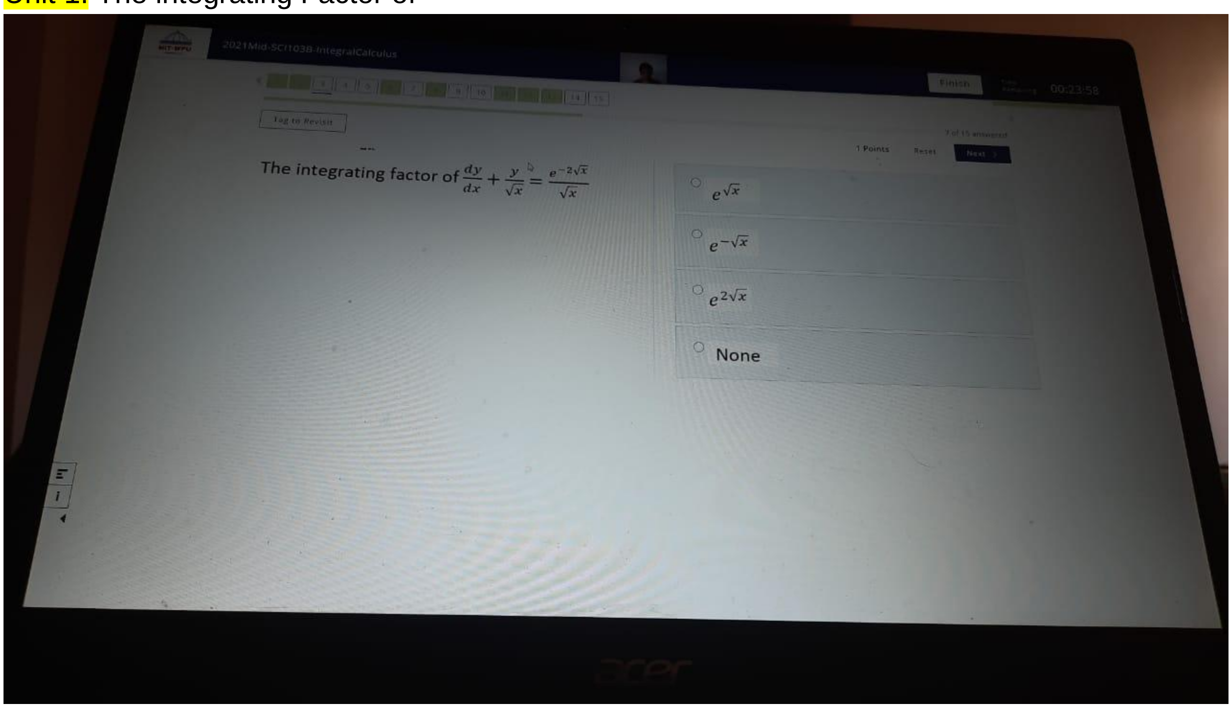
Ans. D

Unit 1 : A circuit containing R and inductance R and Inductance L in series with Voltage source E.



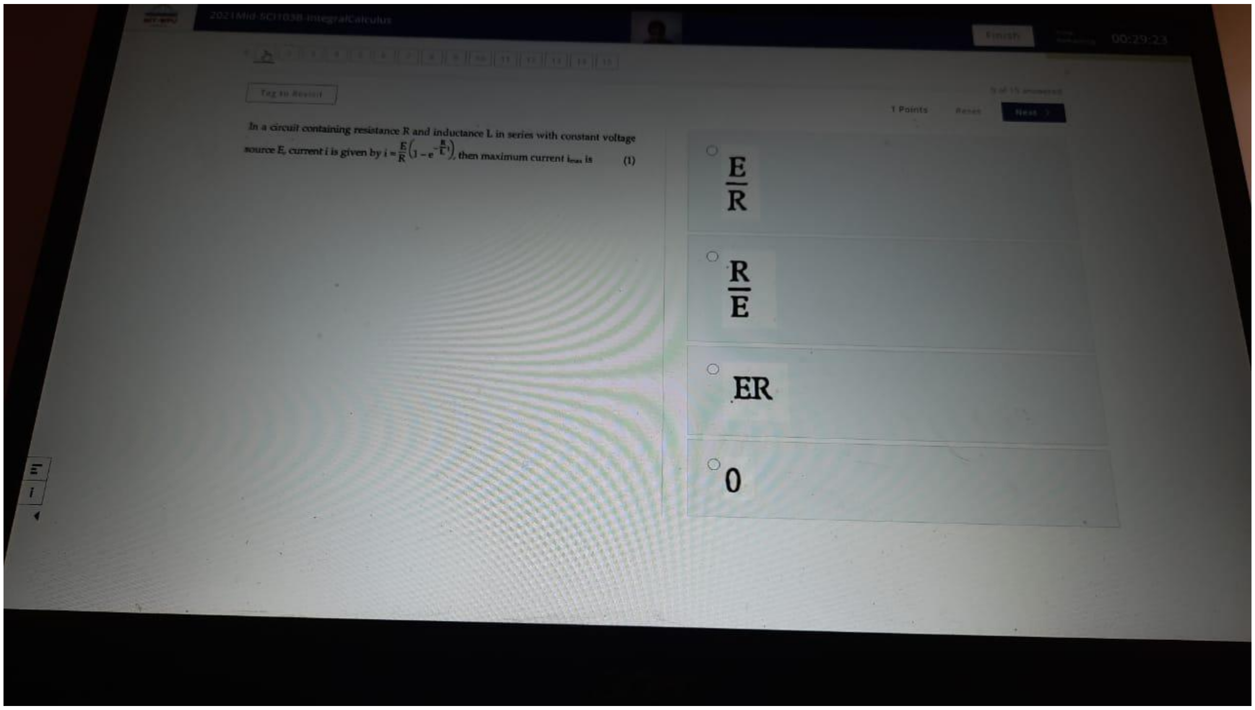
Ans. B

Unit 1: The integrating Factor of



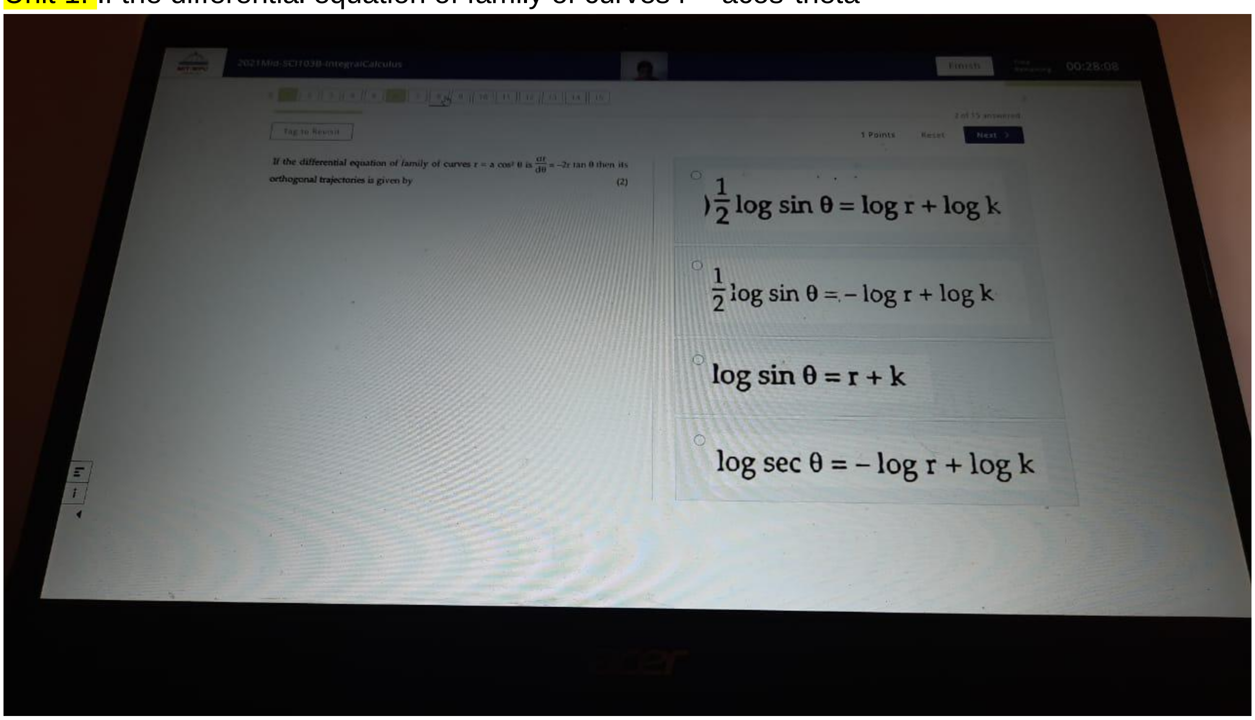
Ans. C

Unit 1 : In a circuit containing resistance R and inductance L in series with constant voltage Source E



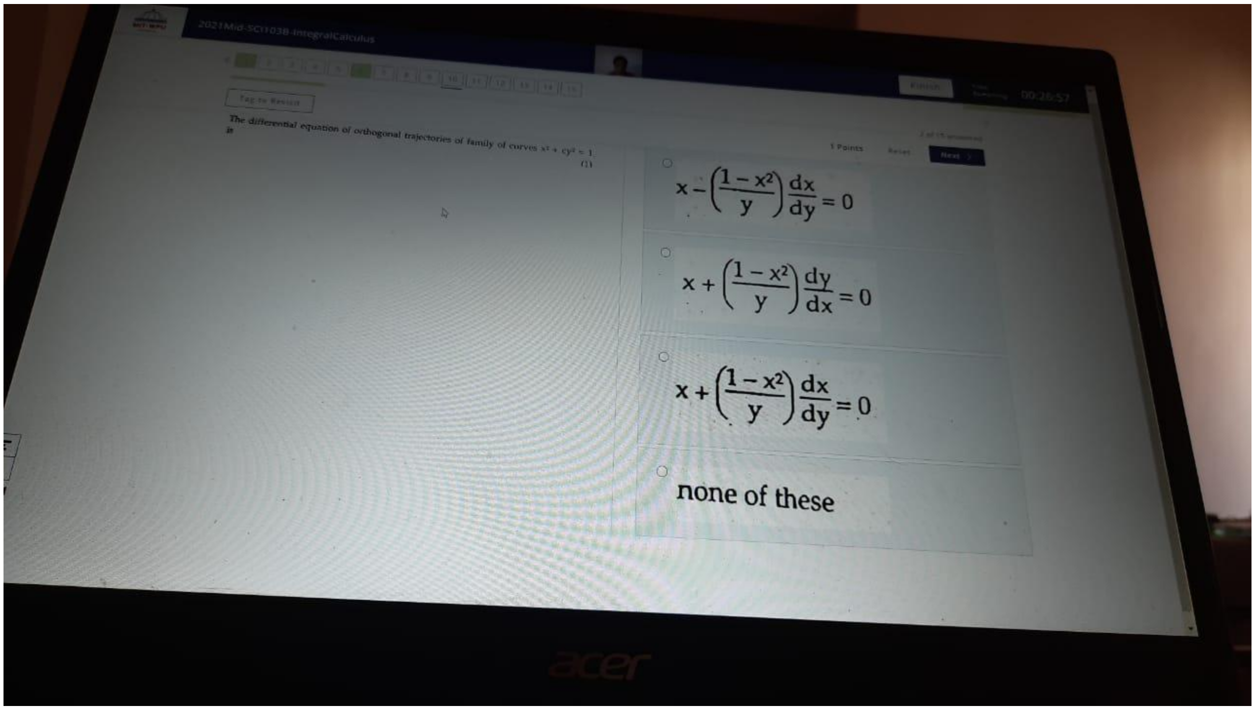
Ans. option A : E/R

Unit 1: If the differential equation of family of curves r = acos^{2}theta



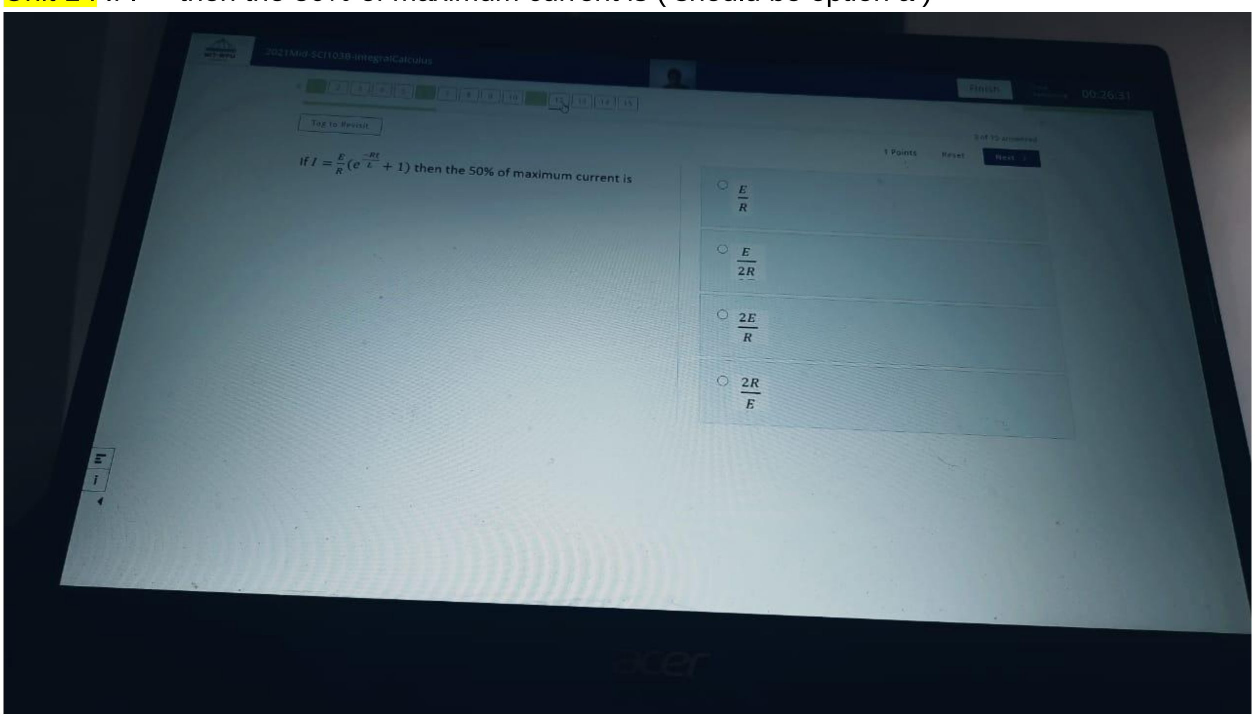
Ans. option B : ½ log sin theta = -log r + log k

Unit 1 : The differential equation of orthogonal trajectories of family of curves



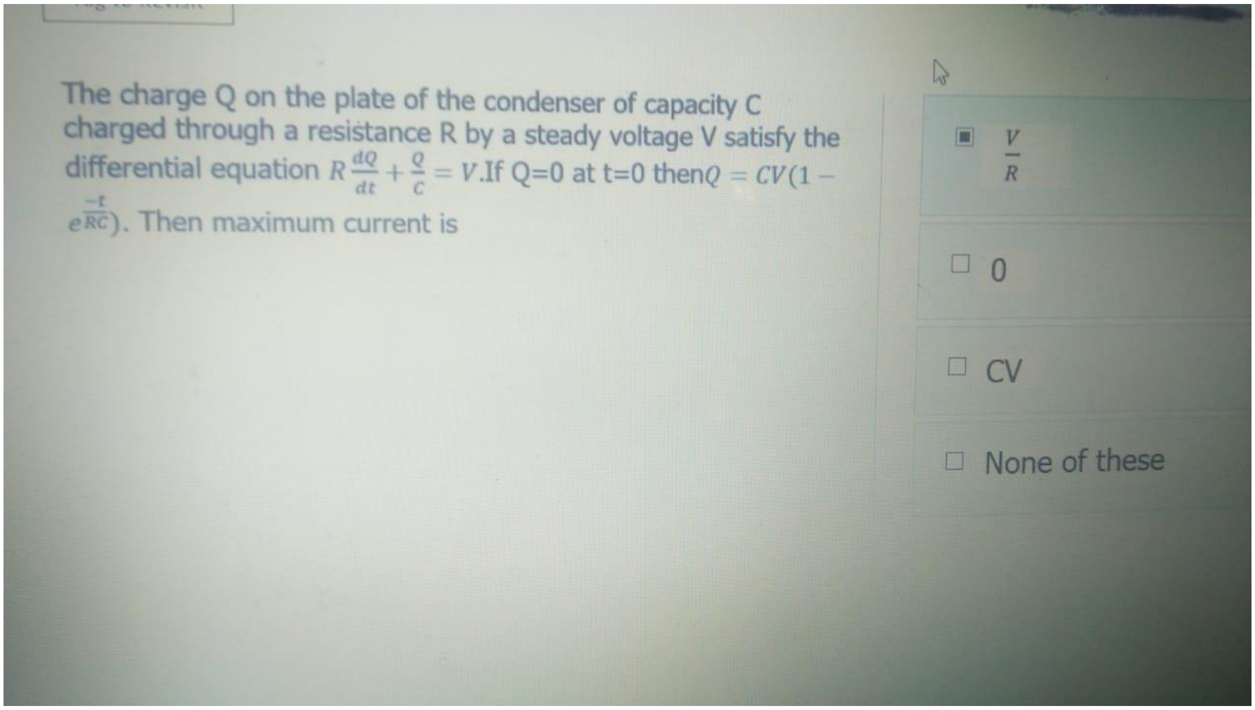
Ans. A

Unit 1 : If I = then the 50% of maximum current is (should be option a)



Ans. A

Unit 1: The charge Q on the plate of the condenser of capacity C charged through resstance R by a steady voltage R by a steady voltage V satisfy the differential equation



Ans. V/R

Unit 1:A steam pipe 20cm in diameter in protected with covering 6cm

A steam pipe 20 cm in diameter is protected with covering 6 cm thick for which thermal conductivity k = 0.0003 in steady state. The inner surface of the pipe is at 200°C and outer surface of the covering is at 30°C and differential equation of conduction of heat is $dT = -\frac{Q}{2\pi k}\frac{dx}{x}$. The amount of heat loss Q is (2)

1 Points Reset

$$\frac{170\,(2\pi k)}{\log(1.6)}$$

$$-\frac{170\,(2\pi k)}{\log(1.6)}$$

$$\frac{\log(1.6)}{170\,(2\pi k)}$$

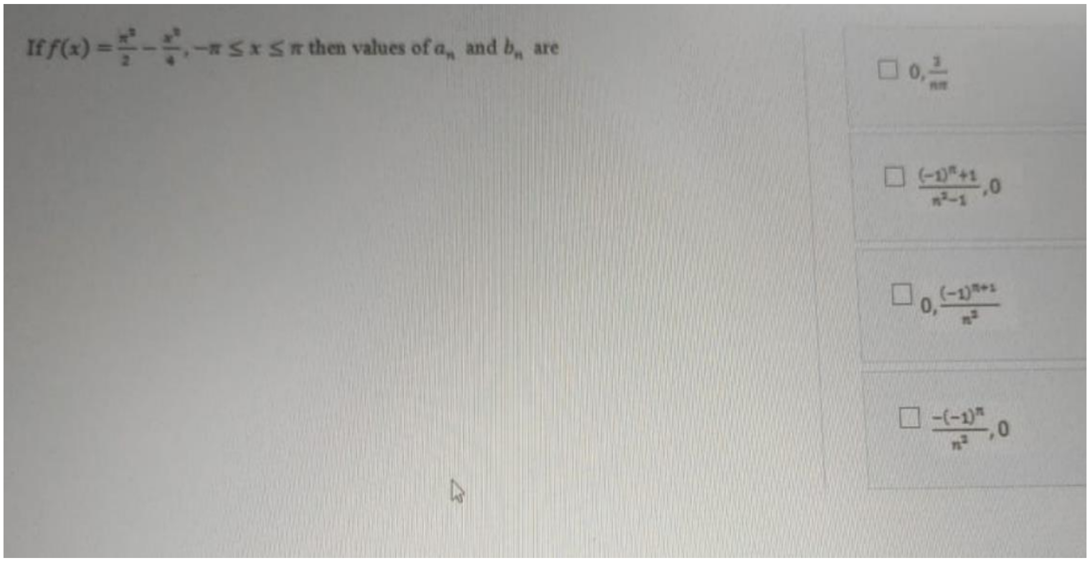
$$\frac{170}{\log(1.6)}$$

Ans: A

Unit: 2

28 questions

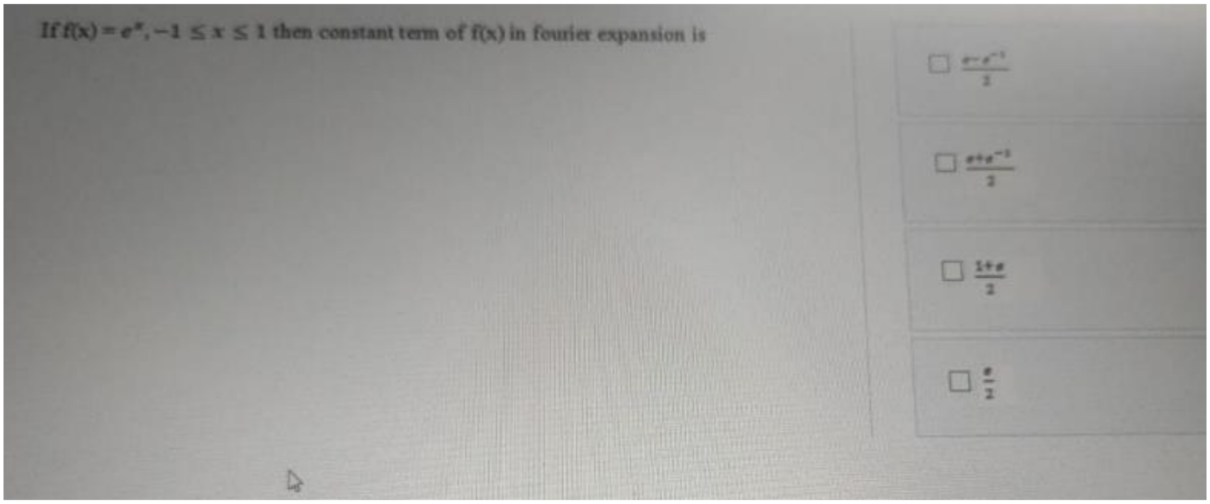
Unit:2 If F(x)= , then the values of an and bn are


If $f(x) = \frac{\pi^2}{2} - \frac{x^2}{4}, -\pi \le x \le \pi$ then values of a_n and b_n are

- $0, \frac{2}{n\pi}$
- $\frac{(-1)^n+1}{n^2-1}, 0$
- $0, \frac{(-1)^{n+1}}{n^2}$
- $\frac{-(-1)^n}{n^2}, 0$

Ans: D

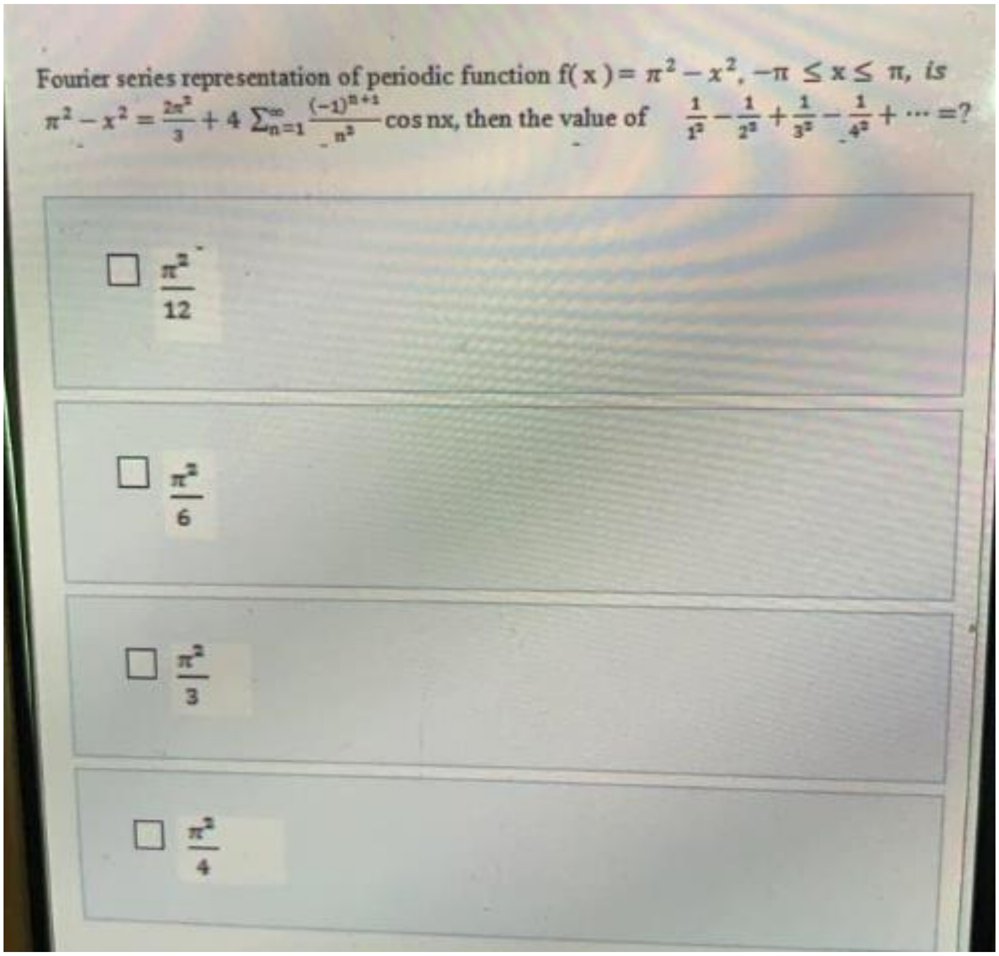
Unit 2: If f(x)=e^x,-1… then constant term of f(x) in fourier expansion is


If $f(x) = e^x, -1 \le x \le 1$ then constant term of f(x) in fourier expansion is

- $\frac{e-e^{-1}}{2}$
- $\frac{e+e^{-1}}{2}$
- $\frac{1+e}{2}$
- $\frac{e}{2}$

Ans A

Unit:2 Fourier series representation of periodic function f(x)=pi^2-x^2 Then the value of:1/(1^2)-1/(2^)2+1/(3^2)+...=?

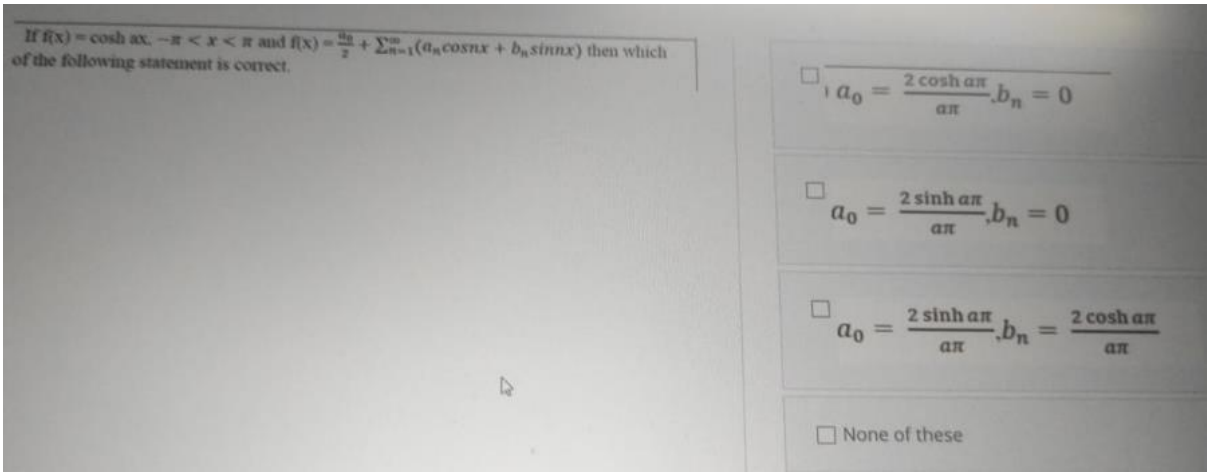


Fourier series representation of periodic function $f(x)=\pi^2-x^2, -\pi \le x \le \pi$, *is* $\pi^2-x^2=\frac{2\pi^2}{3}+4\sum_{n=1}^{\infty}\frac{(-1)^{n+1}}{n^2}\cos nx$, then the value of $\frac{1}{1^2}-\frac{1}{2^2}+\frac{1}{3^2}-\frac{1}{4^2}+\cdots=?$

- ☐ $\frac{\pi^2}{12}$
- ☐ $\frac{\pi^2}{6}$
- ☐ $\frac{\pi^2}{3}$
- ☐ $\frac{\pi^2}{4}$

Ans: C

Unit 2: If f(x)=cosh ax, then which of the following statements is correct.

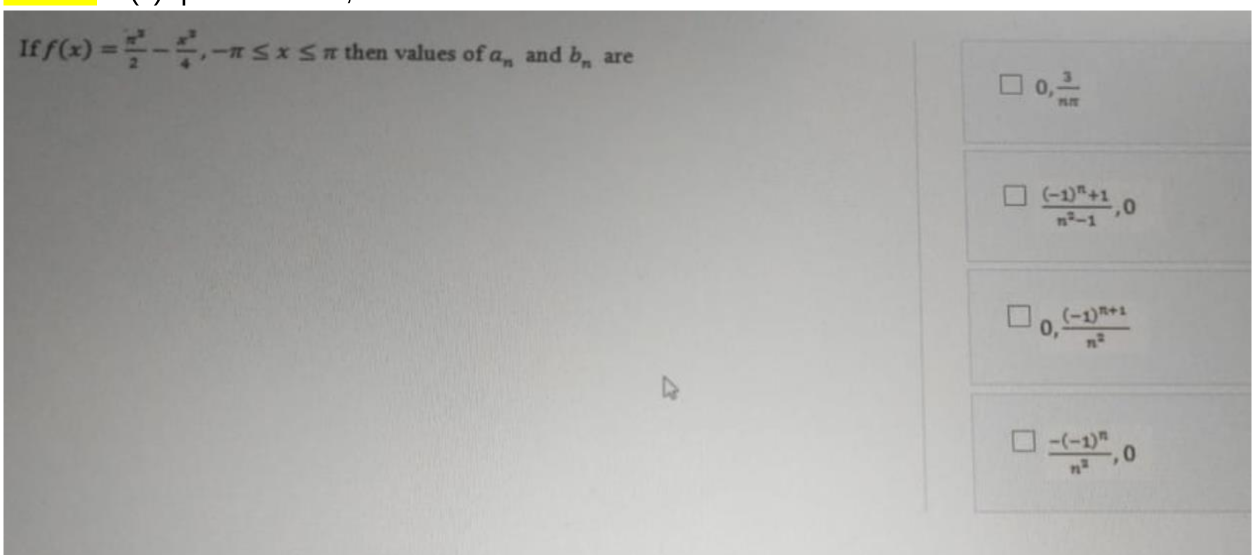


If f(x) = cosh ax, $-\pi < x < \pi$ and f(x) = $\frac{a_0}{2} + \sum_{n=1}^{\infty}(a_n \cos nx + b_n \sin nx)$ then which of the following statement is correct.

- $a_0 = \frac{2\cosh a\pi}{a\pi}, b_n = 0$
- $a_0 = \frac{2\sinh a\pi}{a\pi}, b_n = 0$
- $a_0 = \frac{2\sinh a\pi}{a\pi}, b_n = \frac{2\cosh a\pi}{a\pi}$
- None of these

Answer→ option B

Unit 2: If f(x)=pi^2/2 -x^2/4, then values of an and bn are



If $f(x) = \frac{\pi^2}{2} - \frac{x^2}{4}, -\pi \le x \le \pi$ then values of a_n and b_n are

- $0, \frac{3}{n\pi}$
- $\frac{(-1)^n+1}{n^2-1}, 0$
- $0, \frac{(-1)^{n+1}}{n^2}$
- $\frac{-(-1)^n}{n^2}, 0$

Ans: option D

UNIT 2 :The curve y+f(x) exists in [a,b] .Has a point of inflexion if

The curve y=f(x) exists in [a, b].Has a point of inflexion if

- ☐ $f''(x) < 0$ for all x in [a, b]
- ☐ $f''(x) = 0$ for all x in [a, b]
- ☐ $f''(x) > 0$ for all x in [a, b]
- ☐ $f''(x) = 0$ for some x in [a, b]

Ans:D f"x = 0 for some x in [a,b]

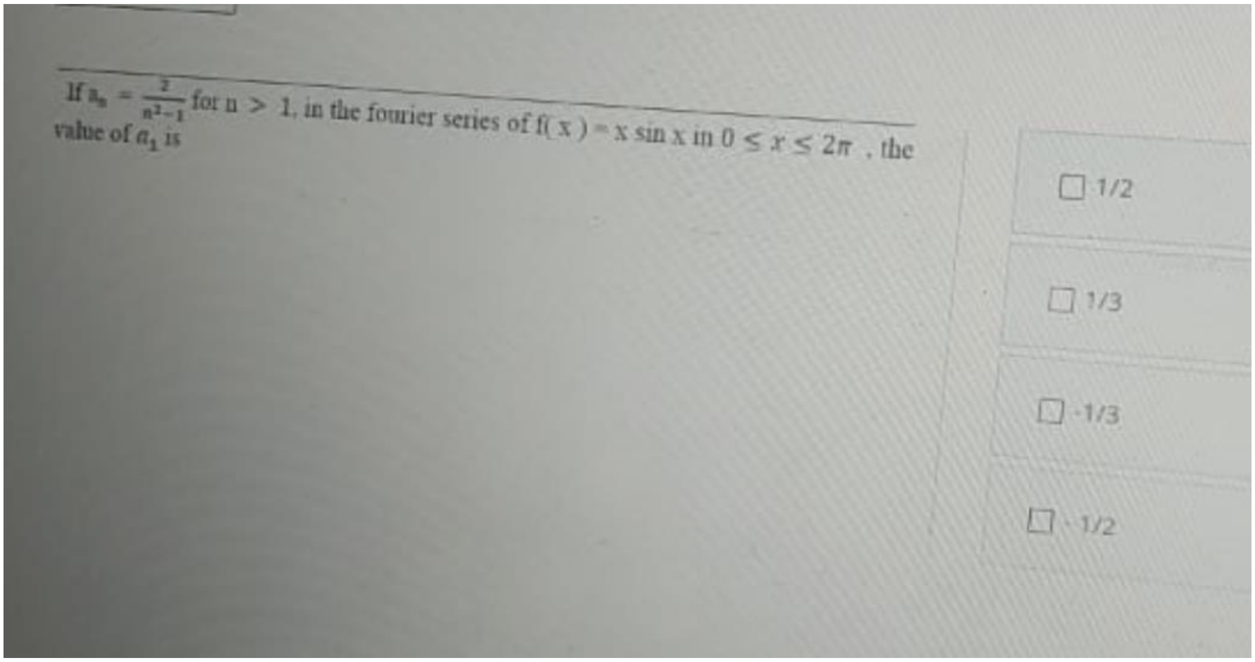
Unit:2 If f(x) the constant term of f(x)= in fourier expansion

If $f(x) = e^x, -1 \le x \le 1$ then constant term of f(x) in fourier expansion is

- ☐ $\frac{e-e^{-1}}{2}$
- ☐ $\frac{e+e^{-1}}{2}$
- ☐ $\frac{1+e}{2}$
- ☐ $\frac{e}{2}$

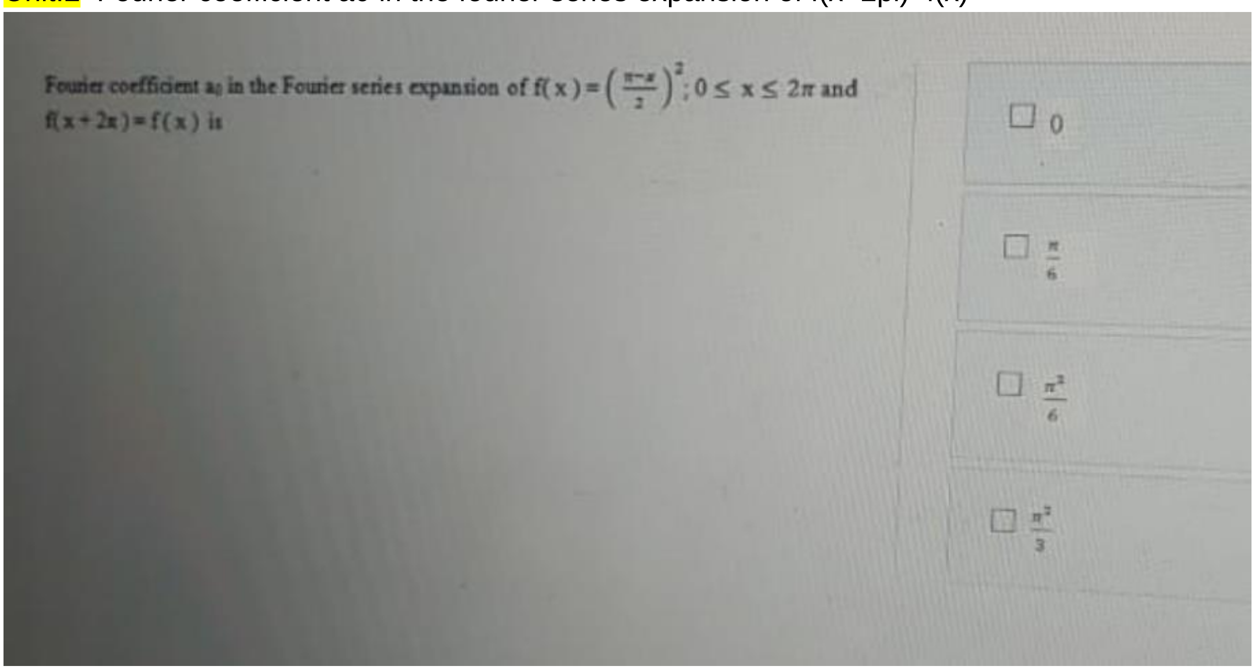
Ans:A

Unit:2 IF a_n=2/n^2-1 for u > 1, the the fourier series of f(X)=x sin x in 0 less than= x less than equal to 2pi, the value of a_1 is



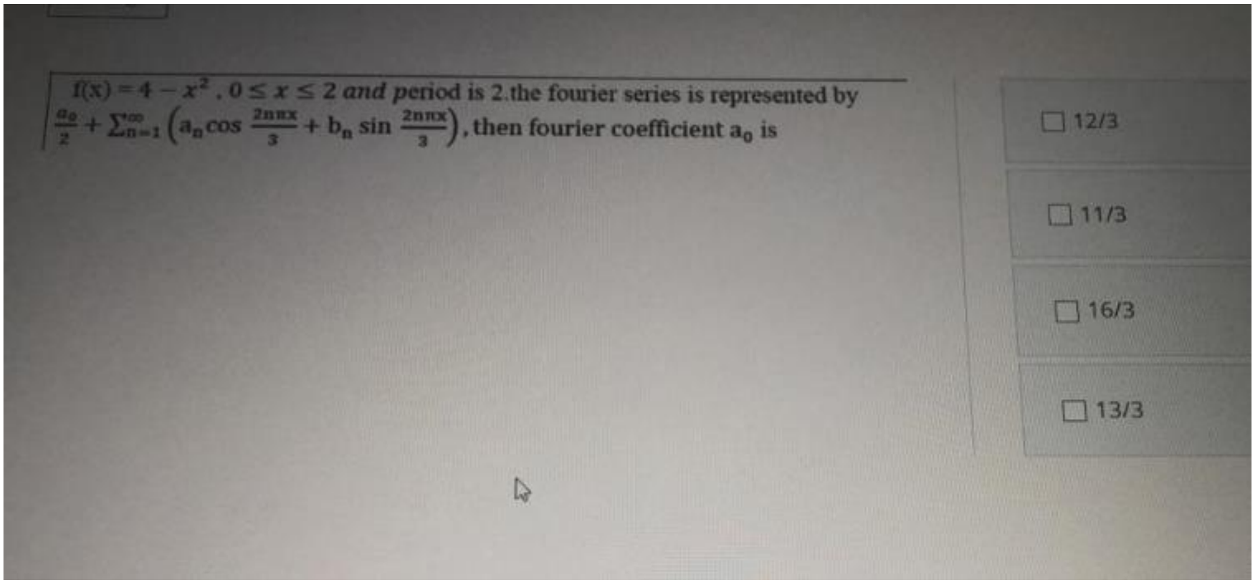
Ans: -½

Unit:2 Fourier coefficient a0 in the fourier series expansion of f(x+2pi)=f(x)



Ans: (pi^2)/12 answer aa rha he

Unit:2 period is 2, the fourier series is represented by, then the fourier coefficient a0 is

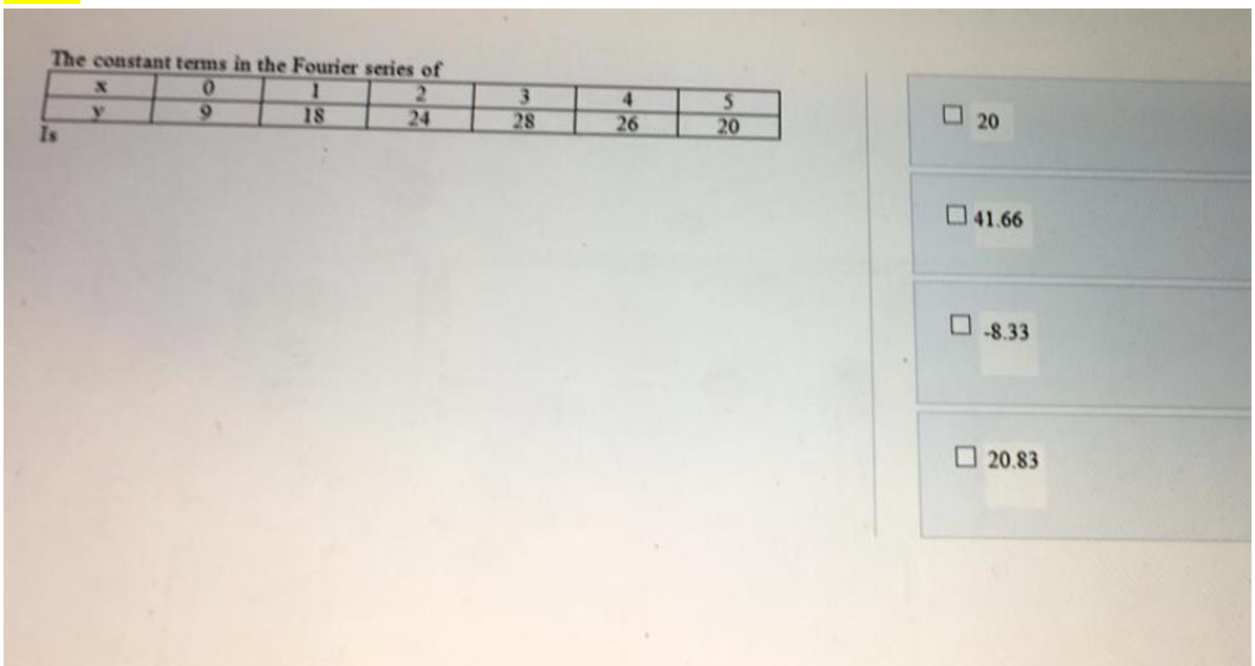


$f(x) = 4 - x^2,\ 0 \le x \le 2$ *and* period is 2.the fourier series is represented by $\frac{a_0}{2} + \sum_{n=1}^{\infty}\left(a_n \cos\frac{2n\pi x}{3} + b_n \sin\frac{2n\pi x}{3}\right)$, then fourier coefficient a_0 is

- ☐ 12/3
- ☐ 11/3
- ☐ 16/3
- ☐ 13/3

Ans: c(16/3)

Unit:2 The Constant terms in the fourier series of



The constant terms in the Fourier series of

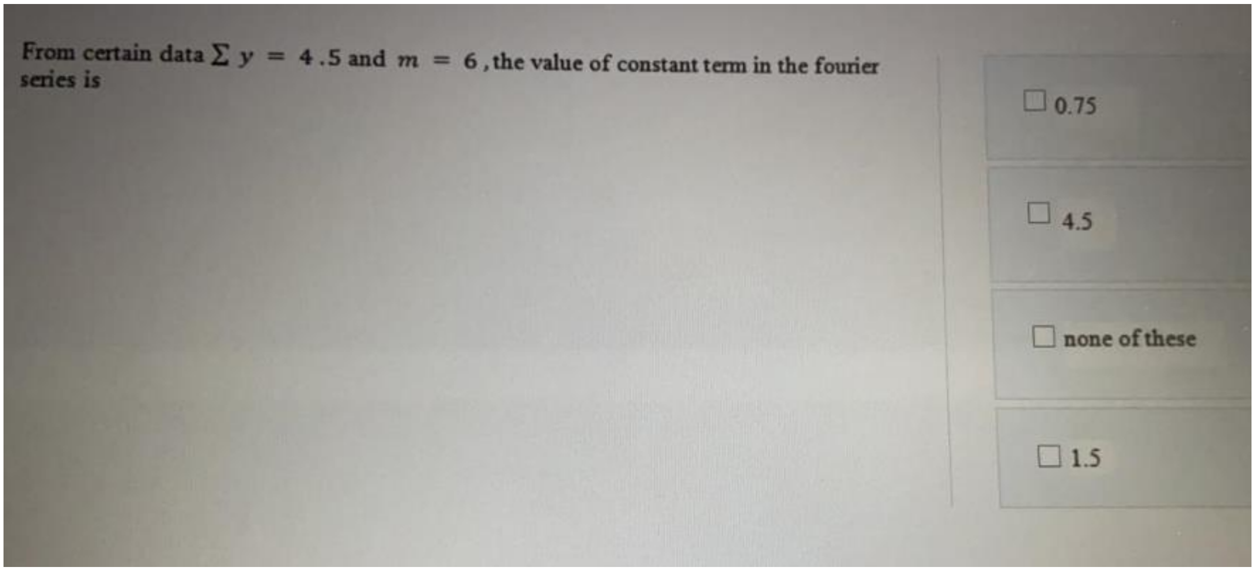
x	0	1	2	3	4	5
y	9	18	24	28	26	20

Is

- ☐ 20
- ☐ 41.66
- ☐ -8.33
- ☐ 20.83

Ans:D(20.83)

Unit:2 From certain Data sigma y=4.5 and m=6, the value of constant term in the fourier series is



From certain data $\sum y = 4.5$ and $m = 6$, the value of constant term in the fourier series is

☐ 0.75

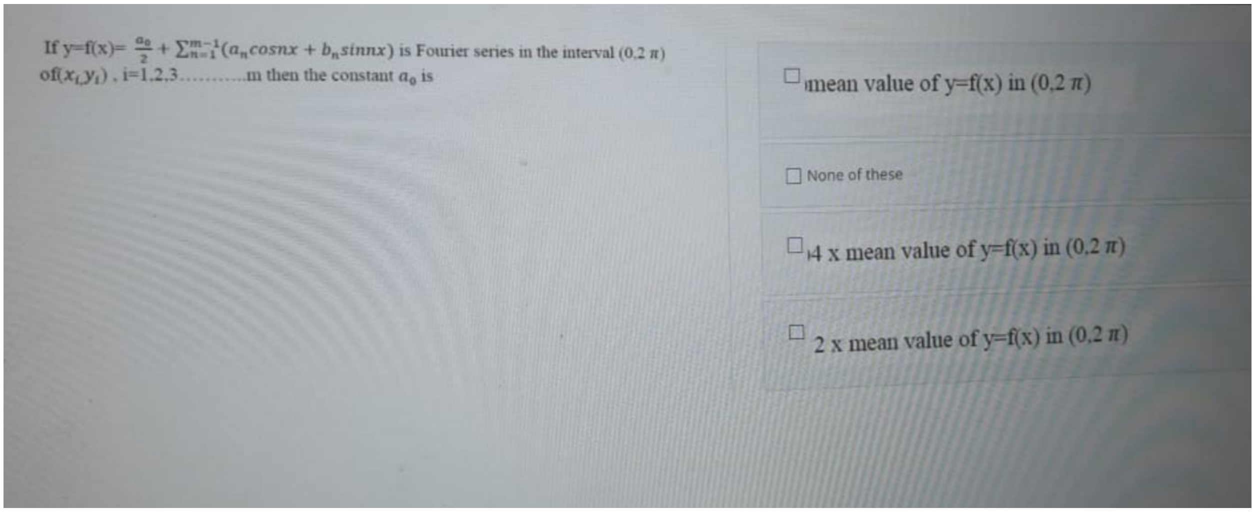
☐ 4.5

☐ none of these

☐ 1.5

Ans:A(0.75)

Unit:2 Fourier series in the interval (0,2 pi) 0f(xi,yi) then constant a0 is



If y=f(x)= $\frac{a_0}{2} + \sum_{n=1}^{m-1}(a_n cosnx + b_n sinnx)$ is Fourier series in the interval $(0,2\pi)$ of(x_i, y_i) , i=1,2,3...........m then the constant a_0 is

☐ mean value of y=f(x) in $(0,2\pi)$

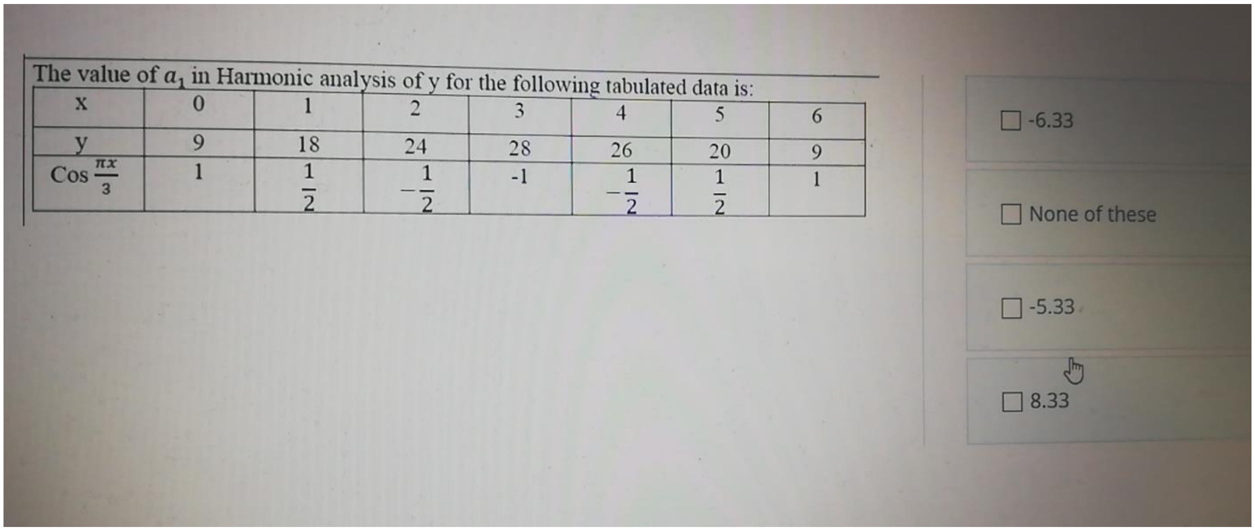
☐ None of these

☐ 4 x mean value of y=f(x) in $(0,2\pi)$

☐ 2 x mean value of y=f(x) in $(0,2\pi)$

Ans: D

Unit:2 The value of a_1 in harmonic analysis of y for the following tabulated data is



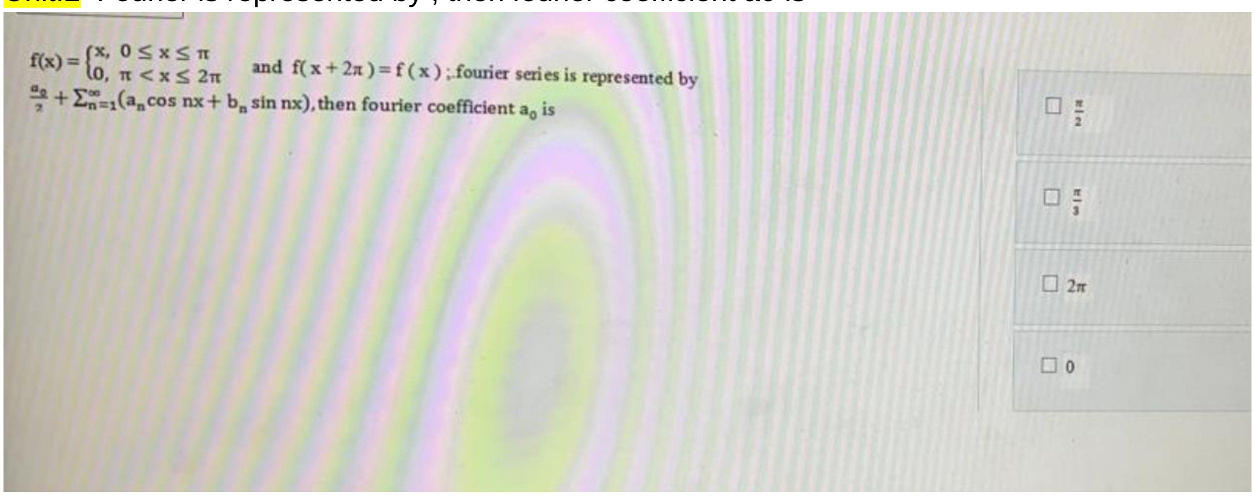
The value of a_1 in Harmonic analysis of y for the following tabulated data is:

x	0	1	2	3	4	5	6
y	9	18	24	28	26	20	9
$\cos\frac{\pi x}{3}$	1	$\frac{1}{2}$	$-\frac{1}{2}$	-1	$-\frac{1}{2}$	$\frac{1}{2}$	1

- -6.33
- None of these
- -5.33
- 8.33

Ans: B (-1)

Unit:2 Fourier is represented by , then fourier coefficient a0 is

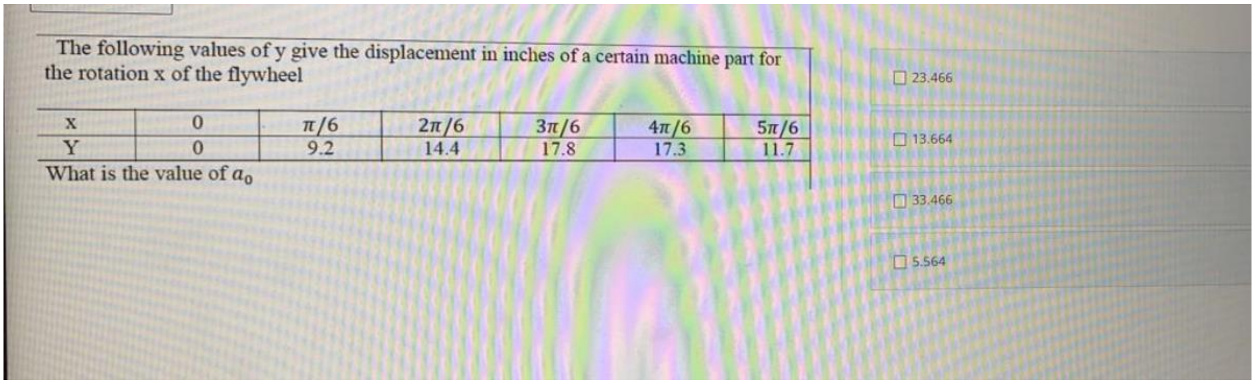


$f(x)=\begin{cases} x, & 0 \le x \le \pi \\ 0, & \pi < x \le 2\pi \end{cases}$ and $f(x+2\pi)=f(x)$; fourier series is represented by $\frac{a_0}{2}+\sum_{n=1}^{\infty}(a_n\cos nx+b_n\sin nx)$, then fourier coefficient a_0 is

- $\frac{\pi}{2}$
- $\frac{\pi}{3}$
- 2π
- 0

Ans: Pi/2

UNIT 2 The following values of y give the displacement in inches of a certain machine part for the rotation



The following values of y give the displacement in inches of a certain machine part for the rotation x of the flywheel

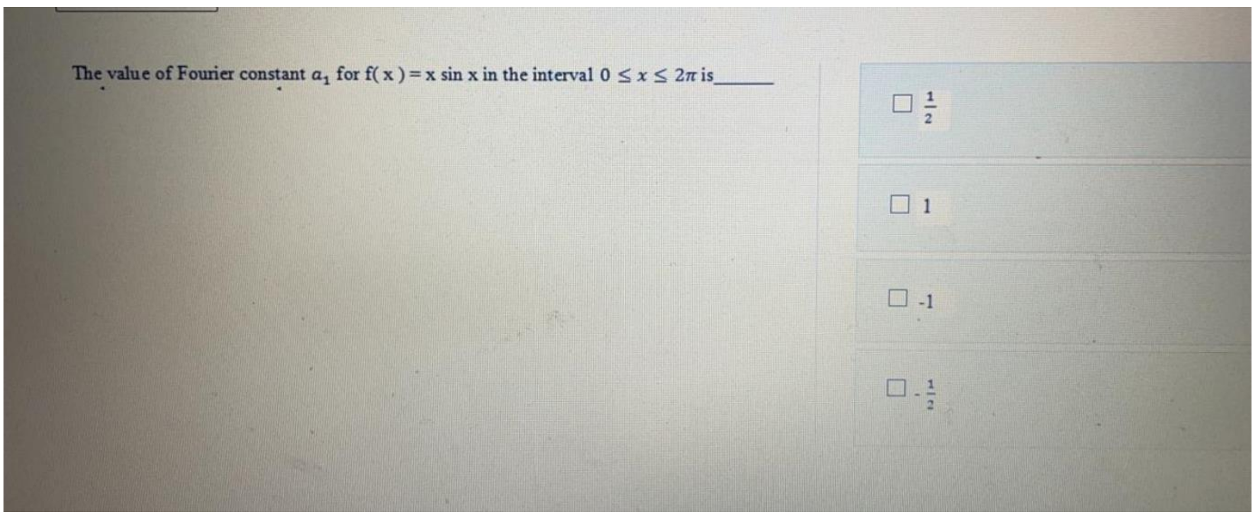
x	0	$\pi/6$	$2\pi/6$	$3\pi/6$	$4\pi/6$	$5\pi/6$
Y	0	9.2	14.4	17.8	17.3	11.7

What is the value of a_0

- ☐ 23.466
- ☐ 13.664
- ☐ 33.466
- ☐ 5.564

Ans: a

Unit 2 : The value of fourier constant a1 for f(x)=xsinx in the interval

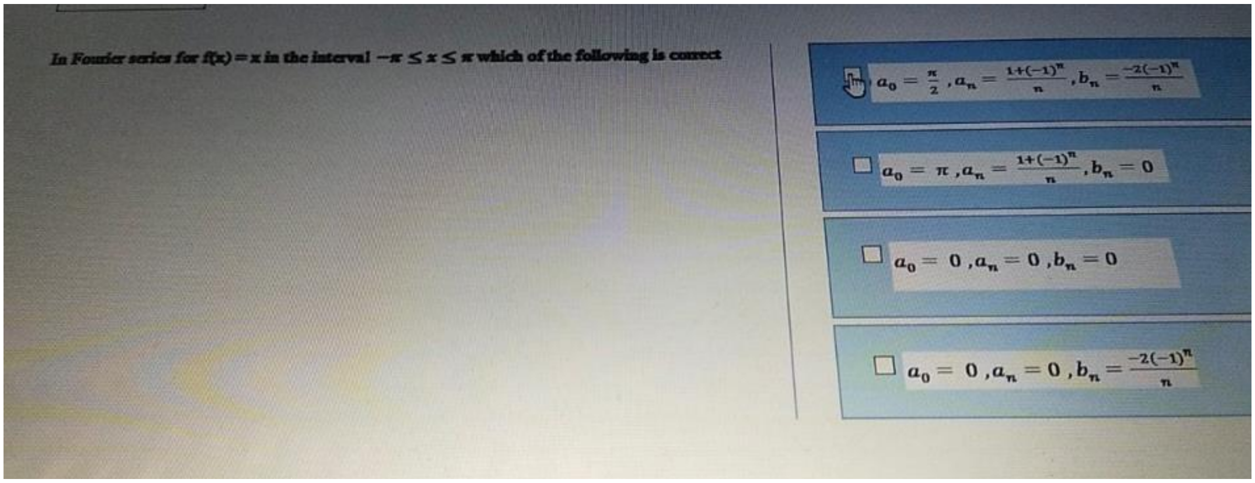


The value of Fourier constant a_1 for $f(x) = x \sin x$ in the interval $0 \leq x \leq 2\pi$ is______

- ☐ $\frac{1}{2}$
- ☐ 1
- ☐ -1
- ☐ $-\frac{1}{2}$

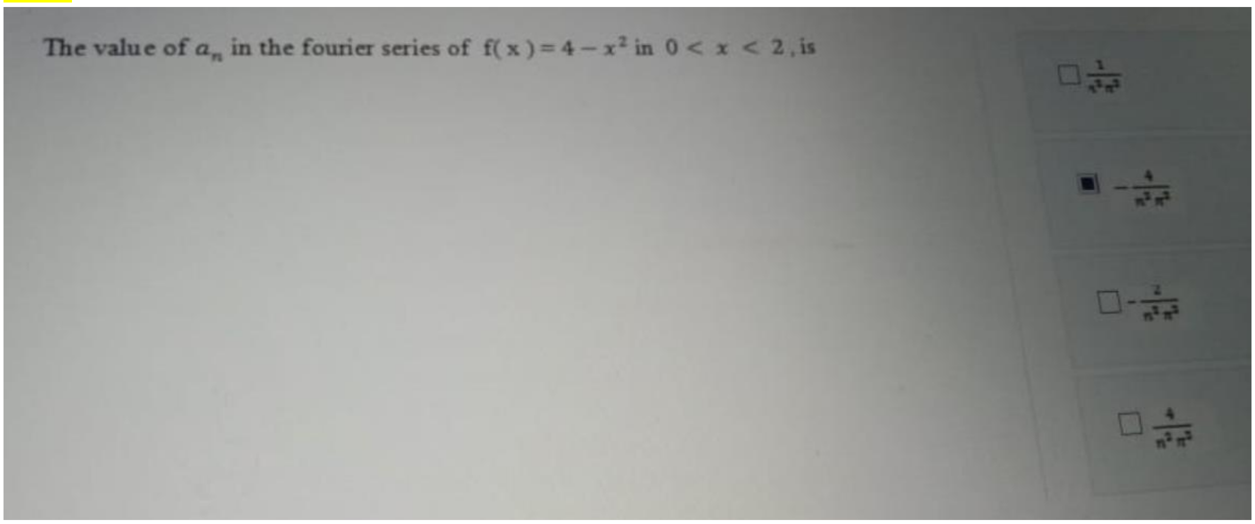
Ans: A = ½

Unit 2 IN fourier series



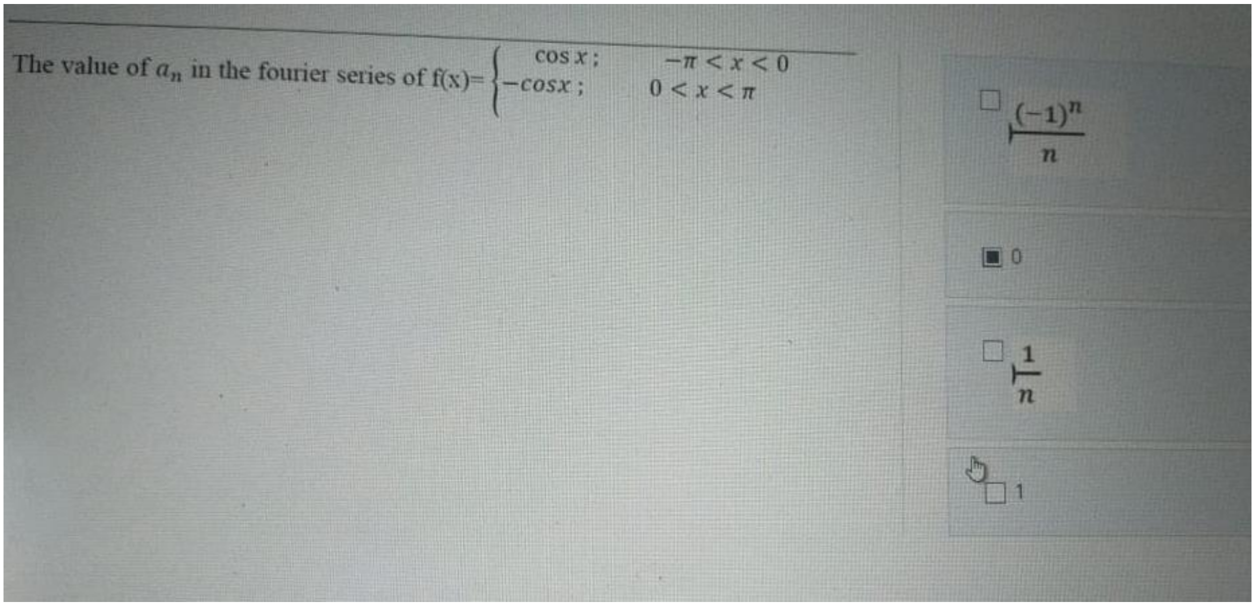
Ans:D

Unit2 The value of a_n in the fourier series of



Ans: - $4/n^2n^2$

Unit: 2 The value of a_n in the fourier series

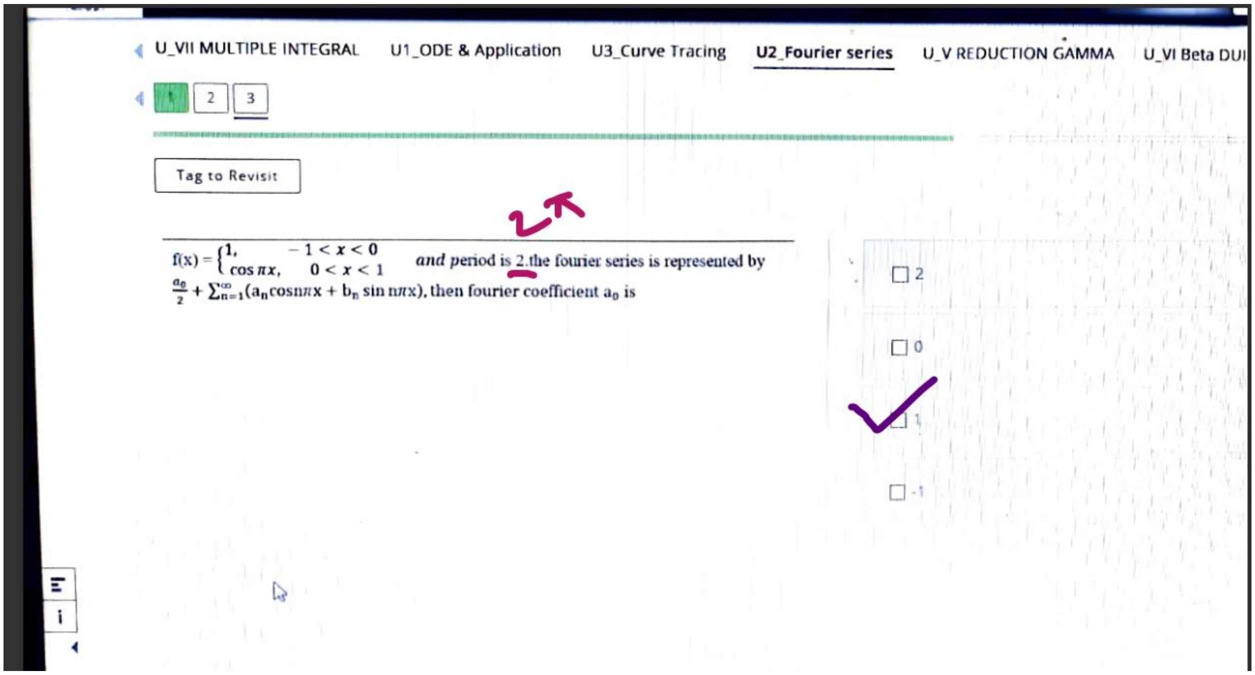


The value of a_n in the fourier series of $f(x)=\begin{cases} \cos x ; & -\pi < x < 0 \\ -\cos x ; & 0 < x < \pi \end{cases}$

- [ ] $\frac{(-1)^n}{n}$
- [x] 0
- [ ] $\frac{1}{n}$
- [ ] 1

Ans: 0

Unit 2 And period is 2. The fourier series is represented by



U_VII MULTIPLE INTEGRAL U1_ODE & Application U3_Curve Tracing **U2_Fourier series** U_V REDUCTION GAMMA U_VI Beta DUI

1 2 3

Tag to Revisit

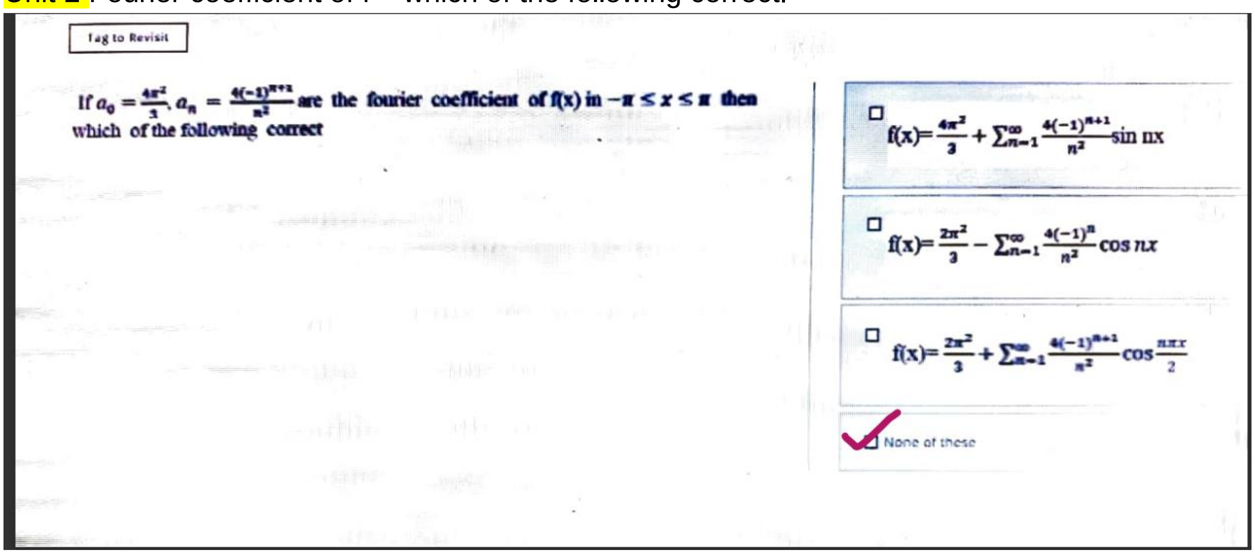
2π

$f(x) = \begin{cases} 1, & -1 < x < 0 \\ \cos \pi x, & 0 < x < 1 \end{cases}$ *and* period is 2.the fourier series is represented by $\frac{a_0}{2} + \sum_{n=1}^{\infty}(a_n \cos n\pi x + b_n \sin n\pi x)$, then fourier coefficient a_0 is

- 2
- 0
- 1
- -1

Answer: 0

Unit 2 Fourier coefficient of f which of the following correct.



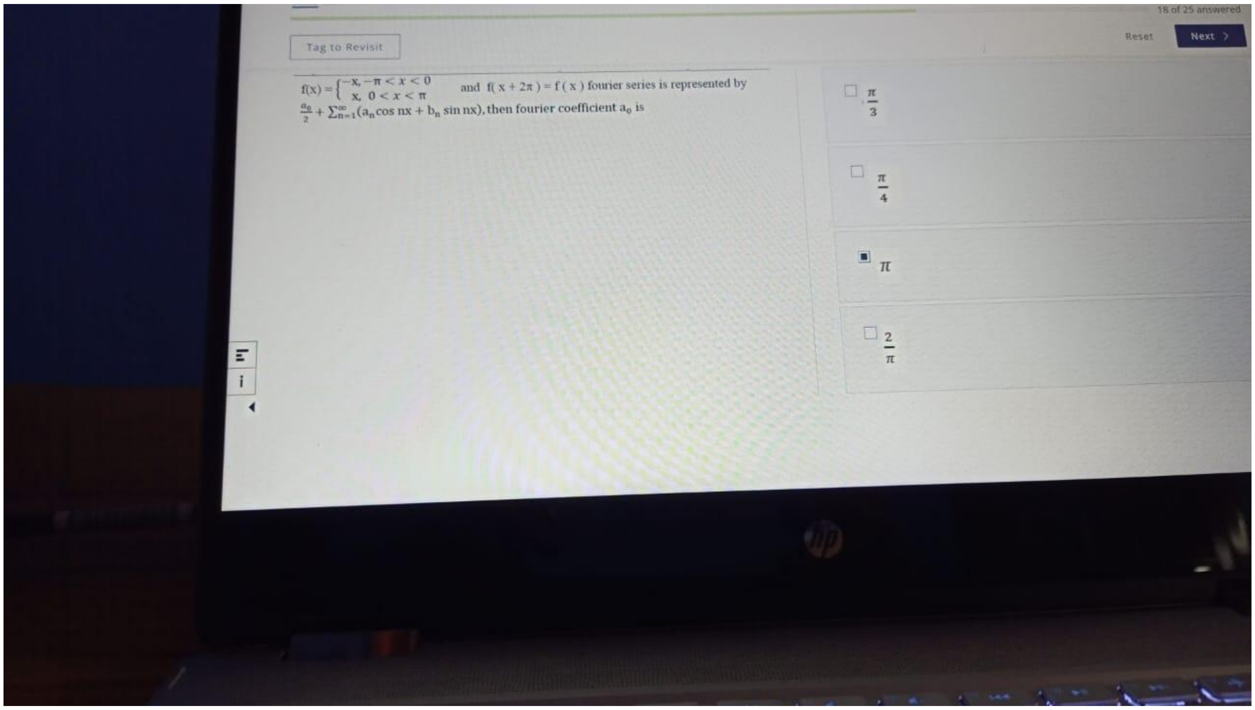
Tag to Revisit

If $a_0 = \frac{4\pi^2}{3}$, $a_n = \frac{4(-1)^{n+1}}{n^2}$ are the fourier coefficient of f(x) in $-\pi \le x \le \pi$ then which of the following correct

- $f(x) = \frac{4\pi^2}{3} + \sum_{n=1}^{\infty} \frac{4(-1)^{n+1}}{n^2} \sin nx$
- $f(x) = \frac{2\pi^2}{3} - \sum_{n=1}^{\infty} \frac{4(-1)^{n}}{n^2} \cos nx$
- $f(x) = \frac{2\pi^2}{3} + \sum_{n=1}^{\infty} \frac{4(-1)^{n+1}}{n^2} \cos \frac{n\pi x}{2}$
- None of these

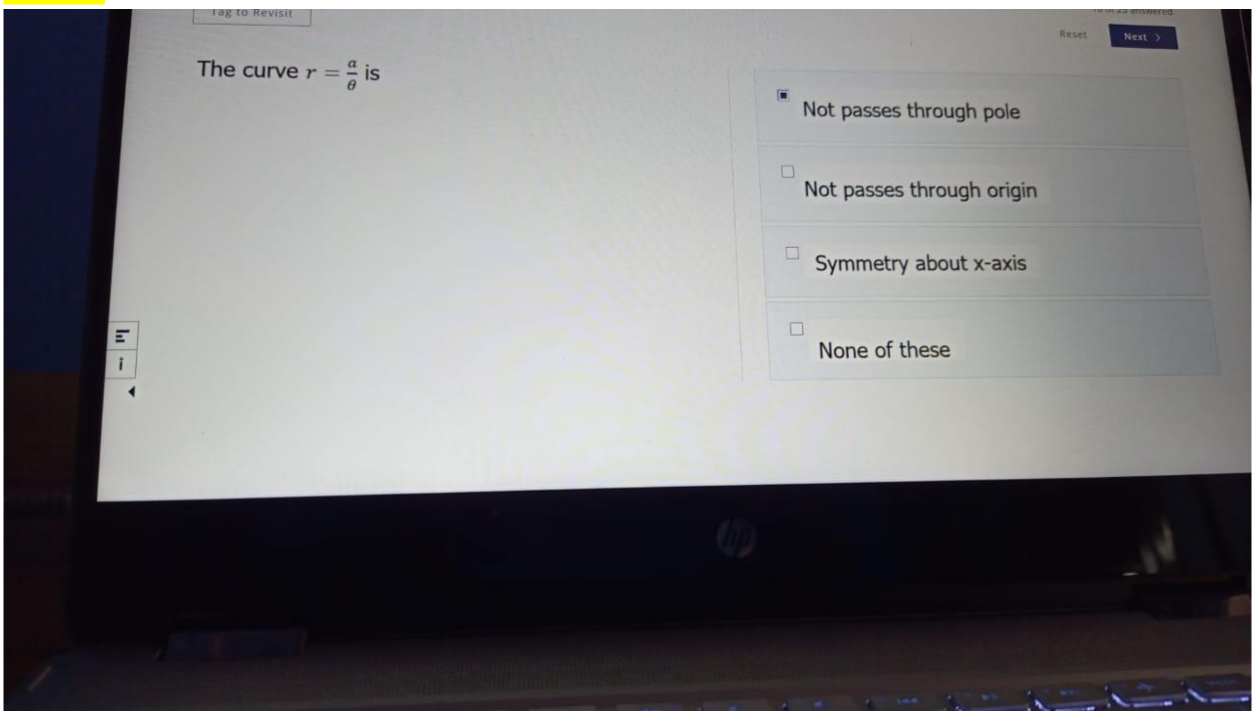
Ans:D

Unit 2 : Fourier series is represented by



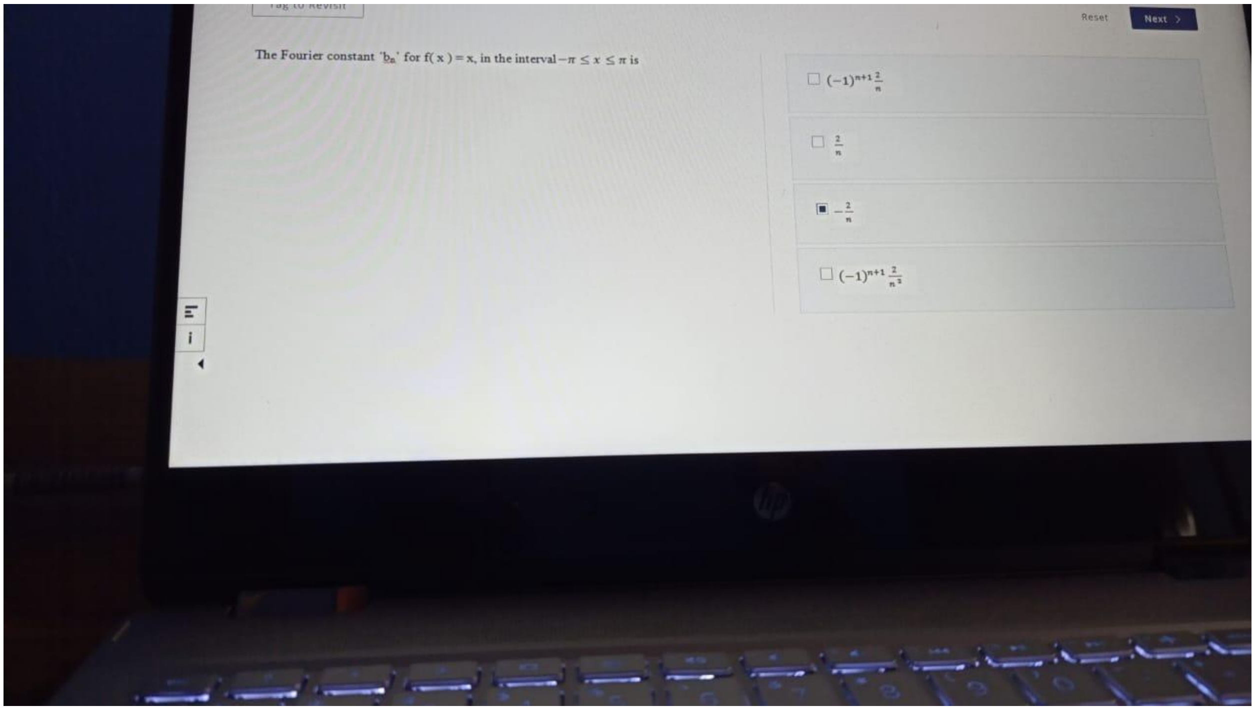
Ans.

Unit 2 : The curve r = a/theta is



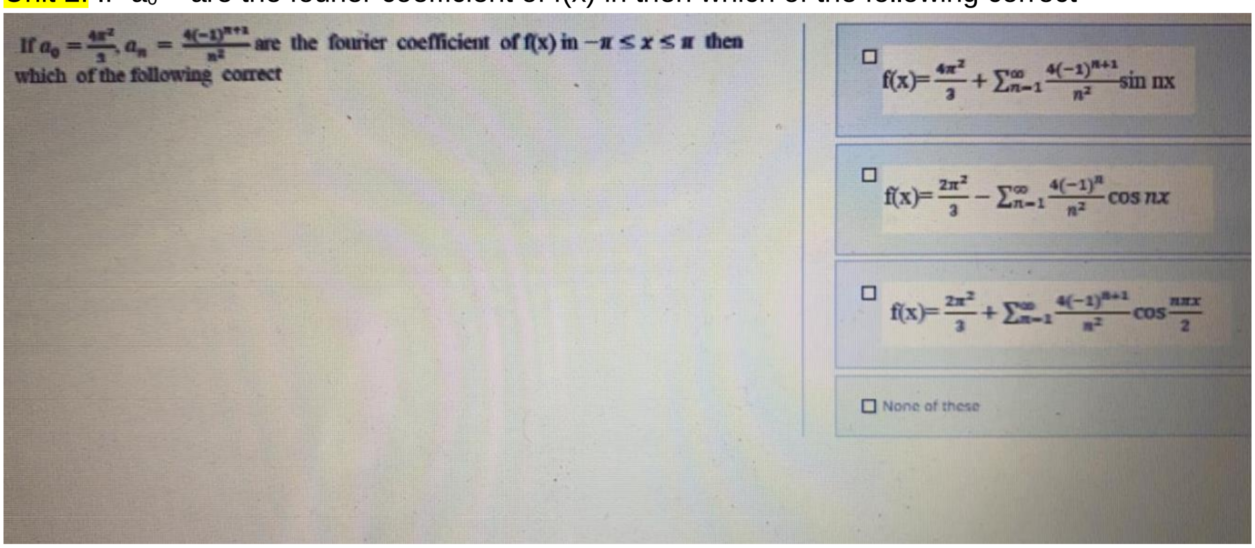
Ans. option A

Unit 2 : The Fourier constant 'b_a' for f(x) = x,



Ans. Option A

Unit 2: IF a_0 are the fourier coefficient of f(x) in then which of the following correct



Ans: D

Unit 2: The second harmonic fourier series of

The second harmonic Fourier series of

x	0	1	2	3	4	5
y	9	18	24	28	26	20

is________

☐ $a_2 \cos \frac{2\pi x}{3} + b_2 \sin \frac{2\pi x}{3}$

☐ $a_2 \cos \pi x + b_2 \sin \pi x$

☐ None of the above

☐ $a_2 \cos 2\pi x + b_2 \sin 2\pi x$

Ans: D

Unit 2: If f(x)=

If $f(x) = \begin{cases} -x, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$, then f(x) is

■ Even function

☐ none of these

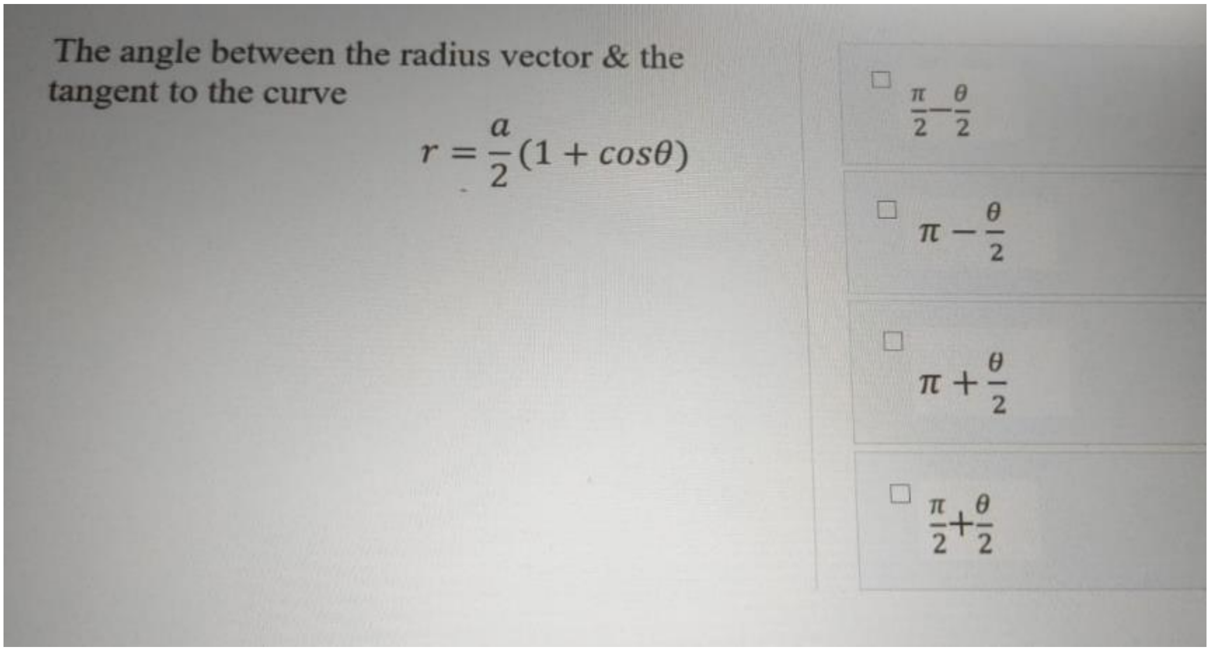
☐ Neither even nor odd

☐ odd function

Ans: Even function

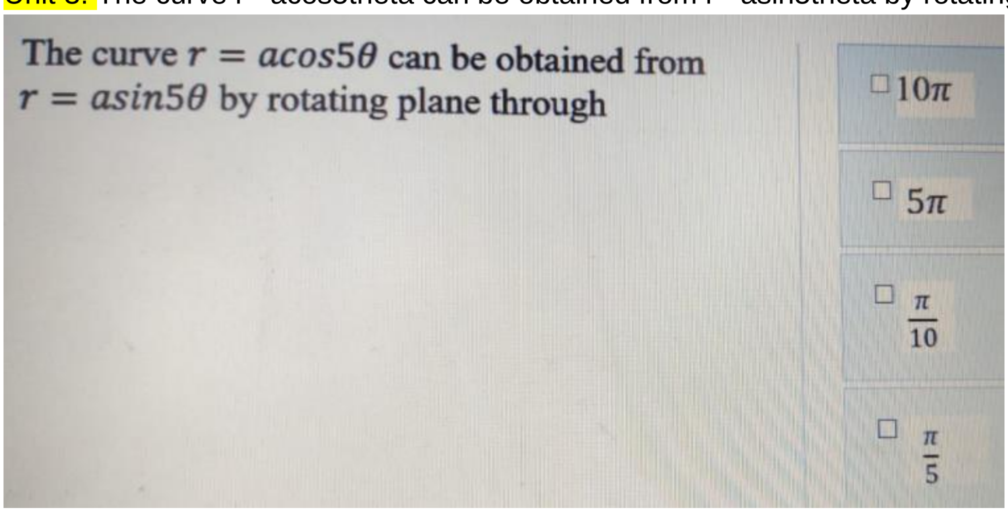
Unit: 3 (22 Questions)

Unit:3 The Angle between the radius vector and the tangent to the curve r=a/2 (1+cos theta)



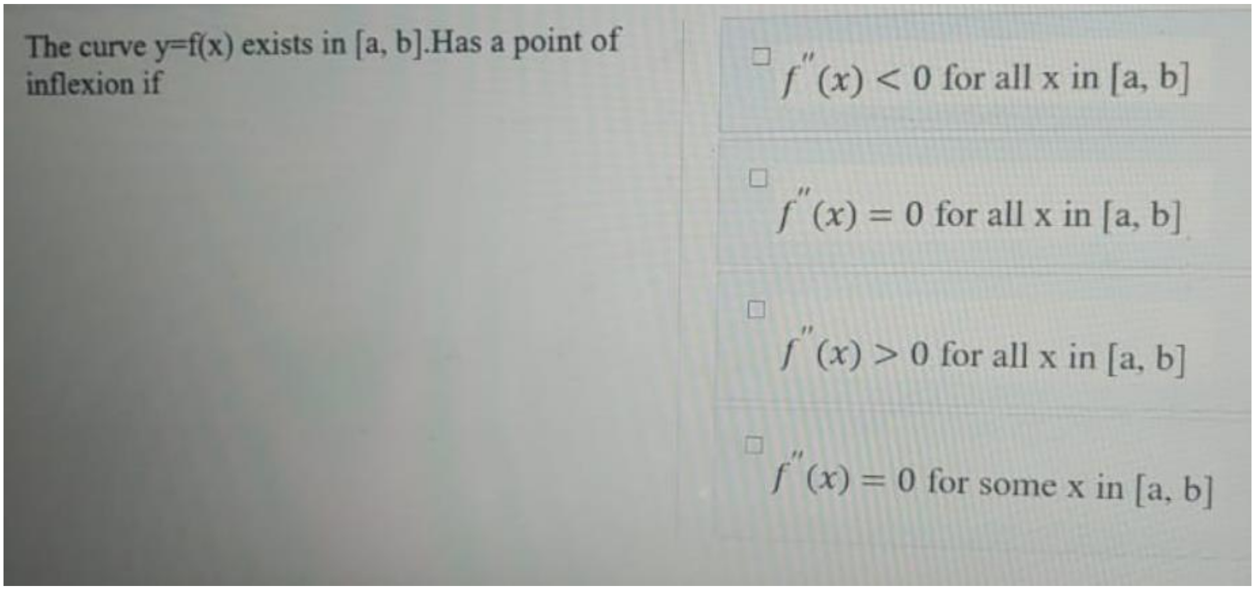
Ans: D

Unit 3: The curve r =acos5theta can be obtained from r =asin5theta by rotating plane through



Ans: option C : pi/10

UNIT 3 The curve y=f(x) exists in [a, b]. Has a point of inflexion if

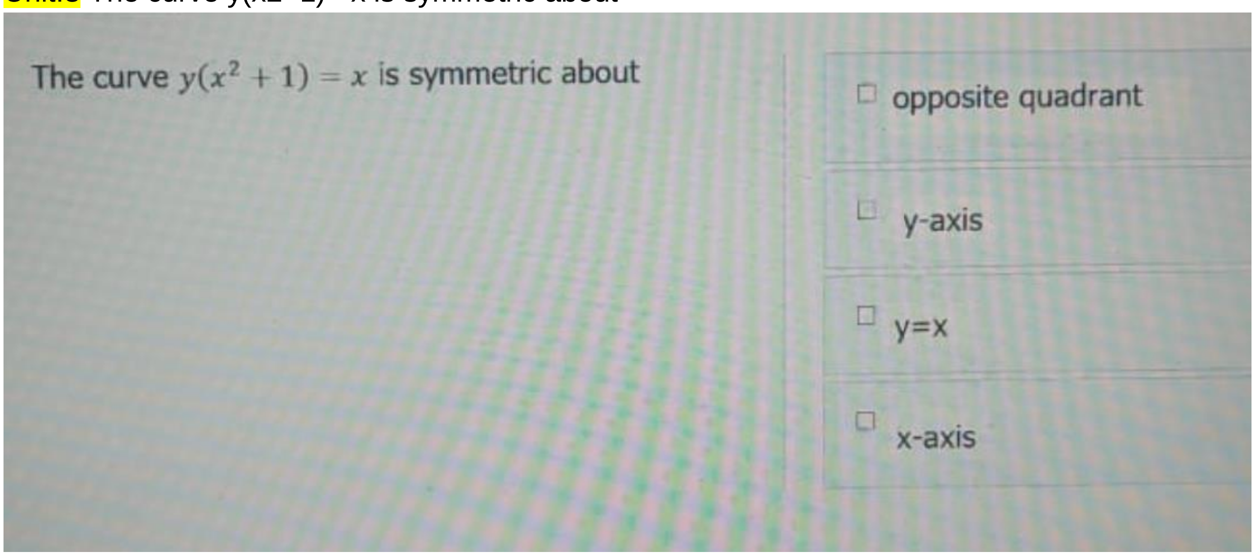


The curve y=f(x) exists in [a, b].Has a point of inflexion if

- $f''(x) < 0$ for all x in [a, b]
- $f''(x) = 0$ for all x in [a, b]
- $f''(x) > 0$ for all x in [a, b]
- $f''(x) = 0$ for some x in [a, b]

Ans: D

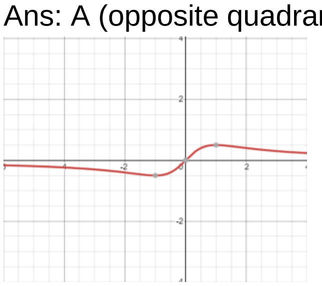
Unit:3 The curve y(x2+1)= x is symmetric about



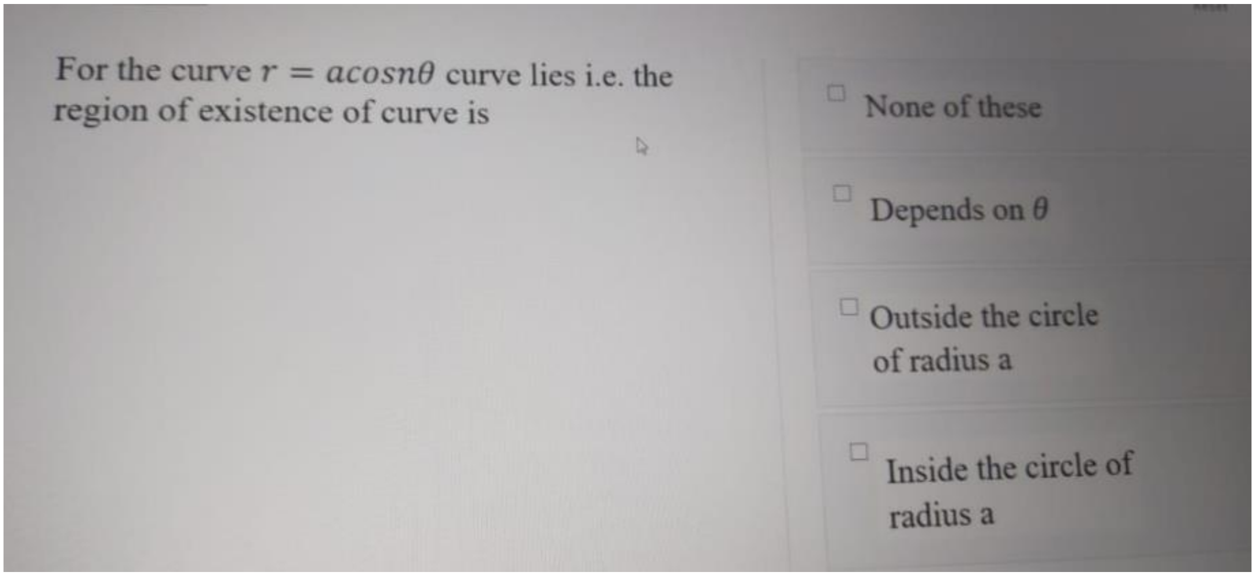
The curve $y(x^2+1) = x$ is symmetric about

- opposite quadrant
- y-axis
- y=x
- x-axis

Ans: A (opposite quadrant)



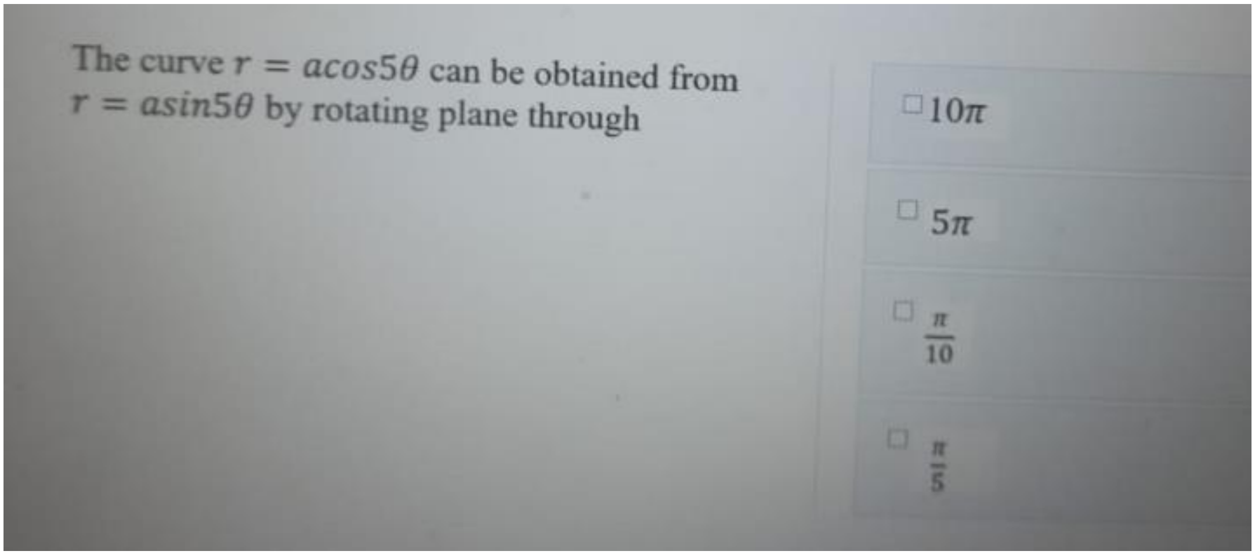
Unit:3 For the curve r=a cos ntheta curve lines i.e the region of existence of curve is


For the curve $r = acosn\theta$ curve lies i.e. the region of existence of curve is

- None of these
- Depends on θ
- Outside the circle of radius a
- Inside the circle of radius a

Ans: Inside the circle of radius a (D)

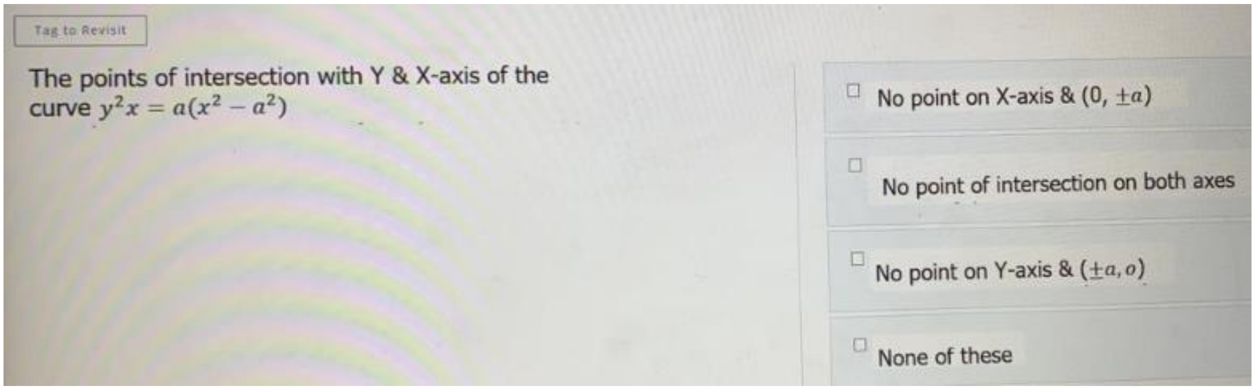
Unit:3 The Curve r=acos5(theta) can be obtained from r=asin5(theta) by rotating plane through


The curve $r = acos5\theta$ can be obtained from $r = asin5\theta$ by rotating plane through

- 10π
- 5π
- $\frac{\pi}{10}$
- $\frac{\pi}{5}$

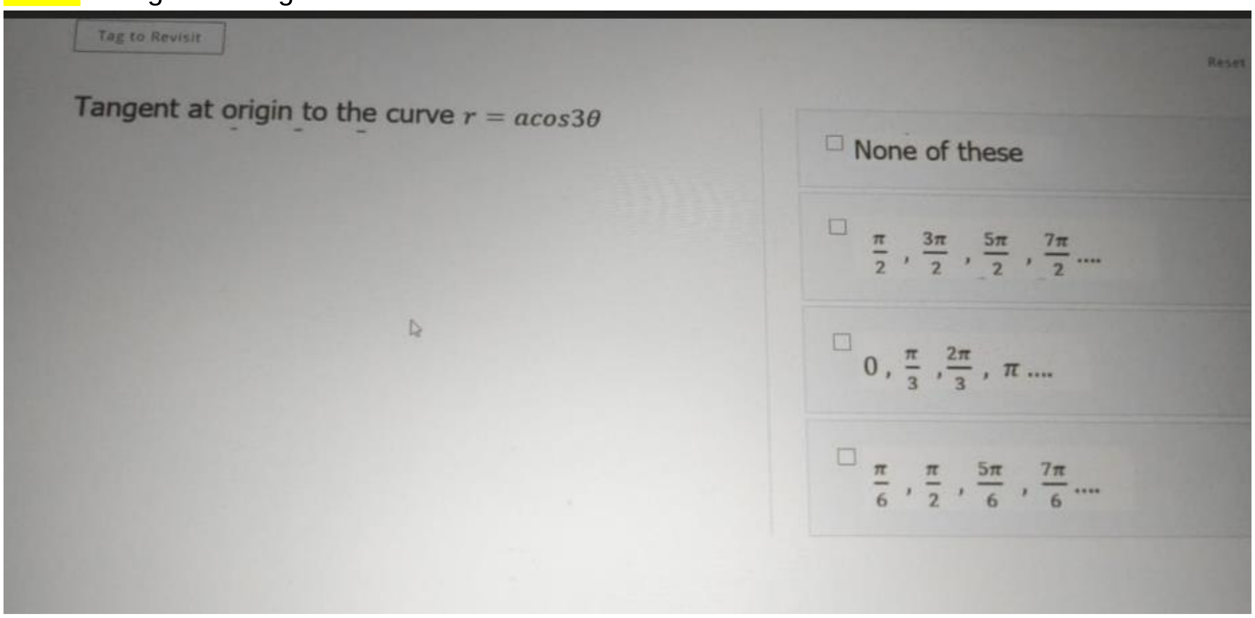
Ans: C
Pi/10

UNIT 3 The points of intersection with y and x axis of the curve y^2x=a(x^2-a^2)



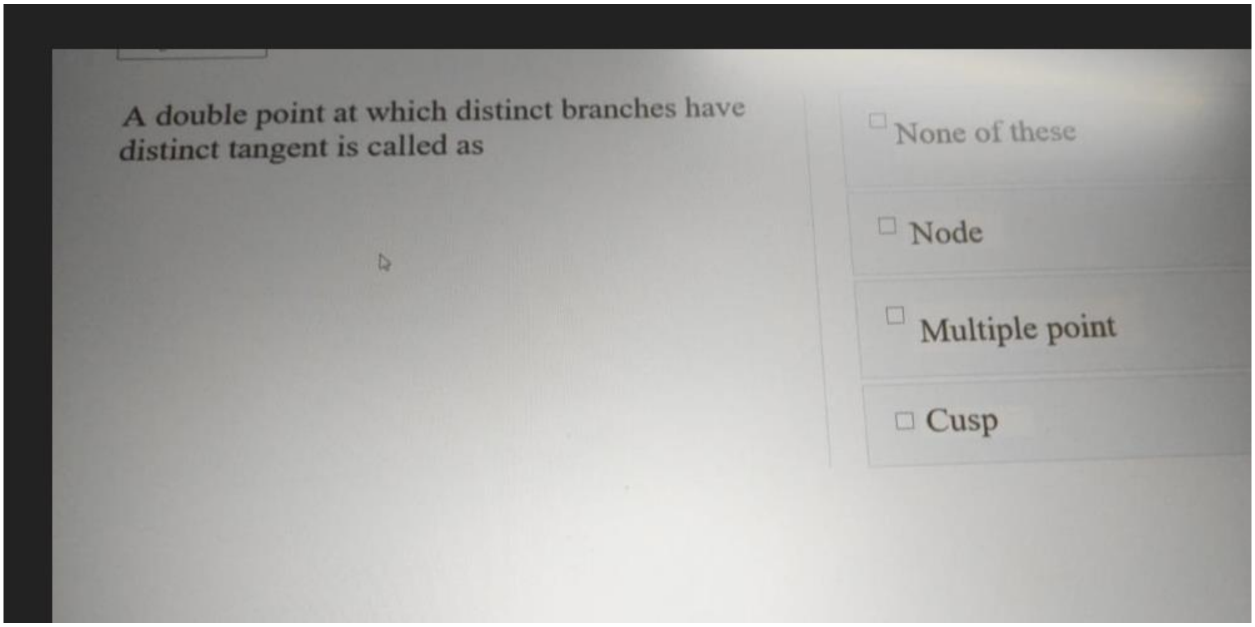
Ans: None of these

Unit 3 :Tangent at origin to the curve r=acos3theta



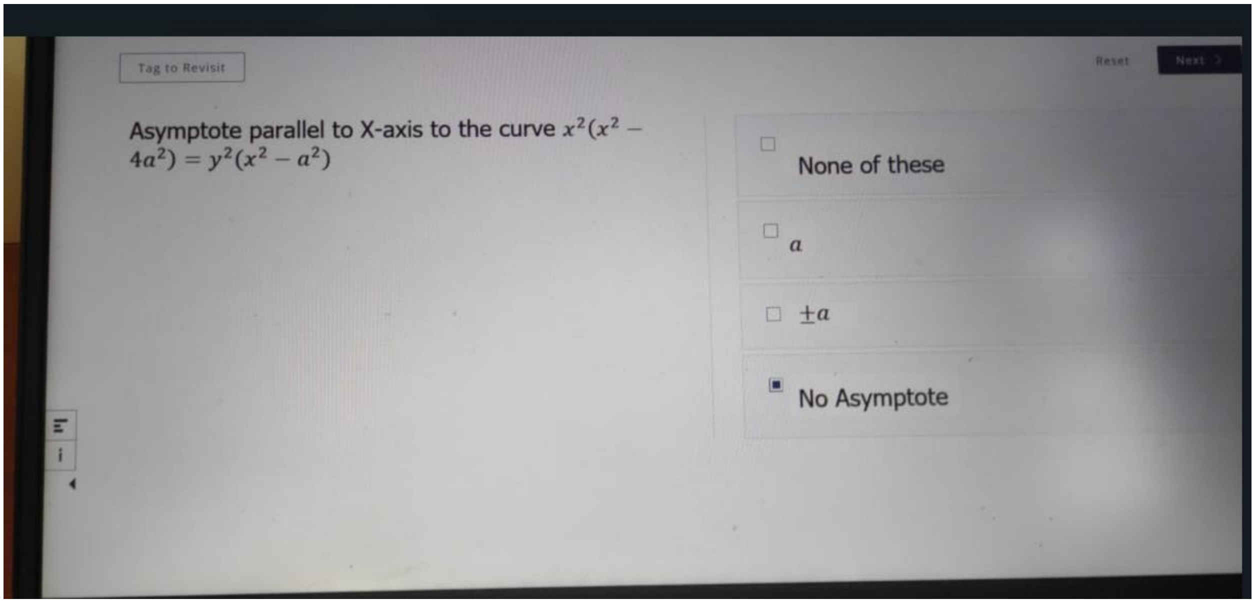
Ans: d

Unit 3 : A double point at which distinct branches have distinct tangent is called as



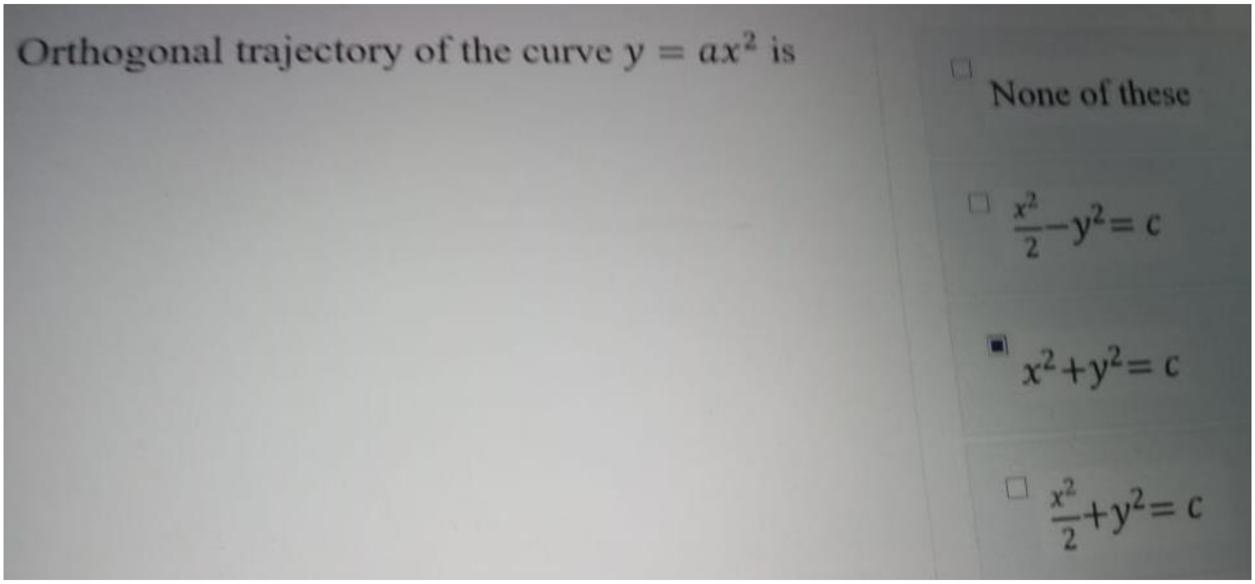
Ans: Node

Unit 3 :Asymptote parallel to x axis to the curve x^2(x^2-4a^2)=y^2(x^2-a^2)



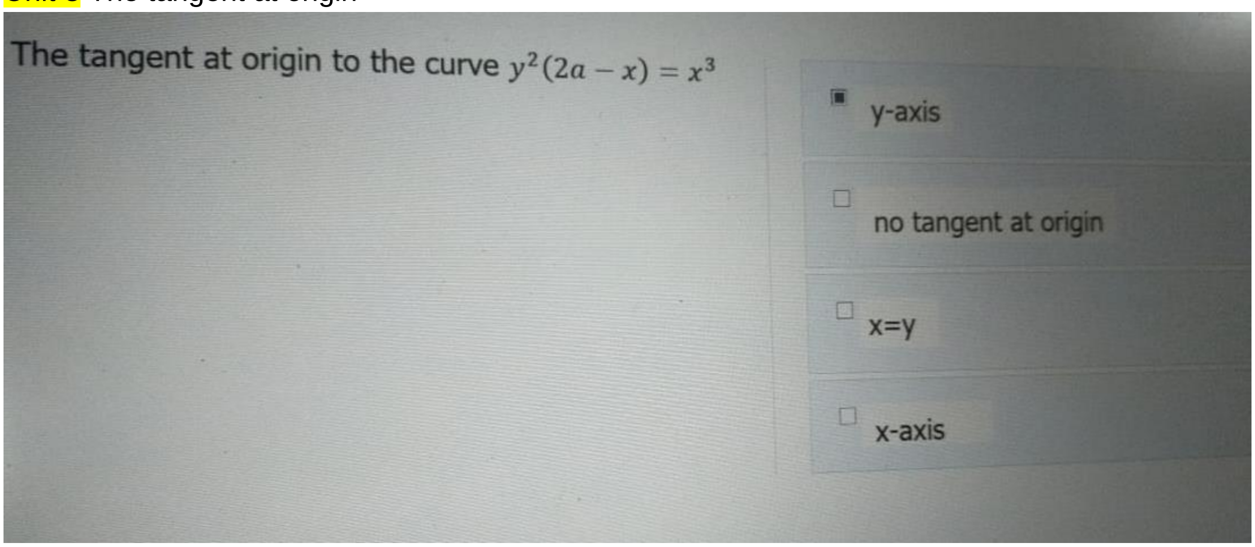
Ans (+- a)

Unit 3 Orthogonal trajectory of the curve y= ax^2



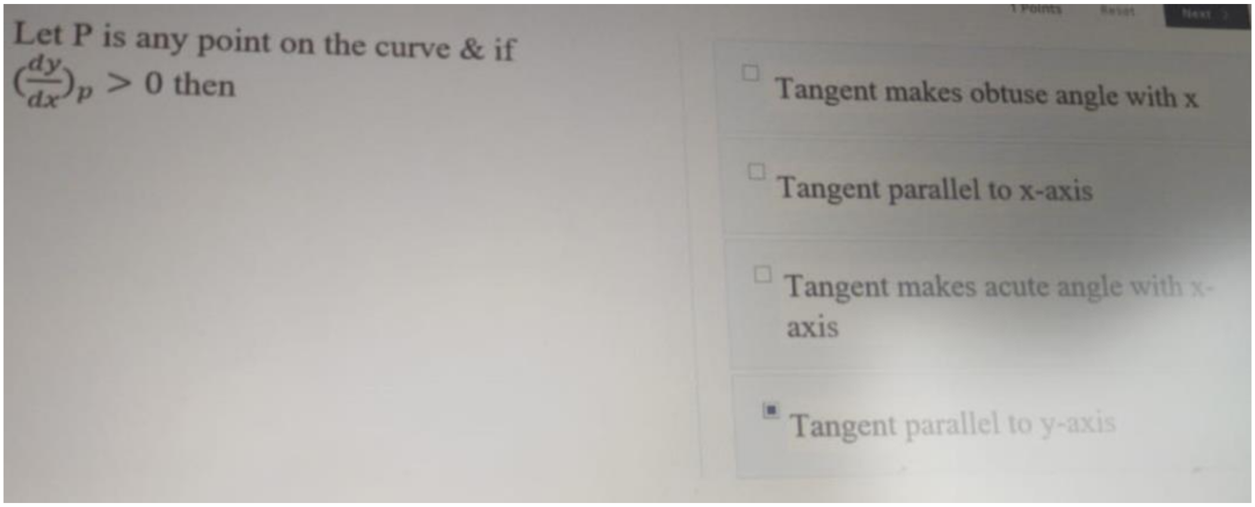
Ans: X^2+Y^2=3

Unit 3 The tangent at origin



Ans: y-axis

Unit 3 Let P is any point on the curve and if



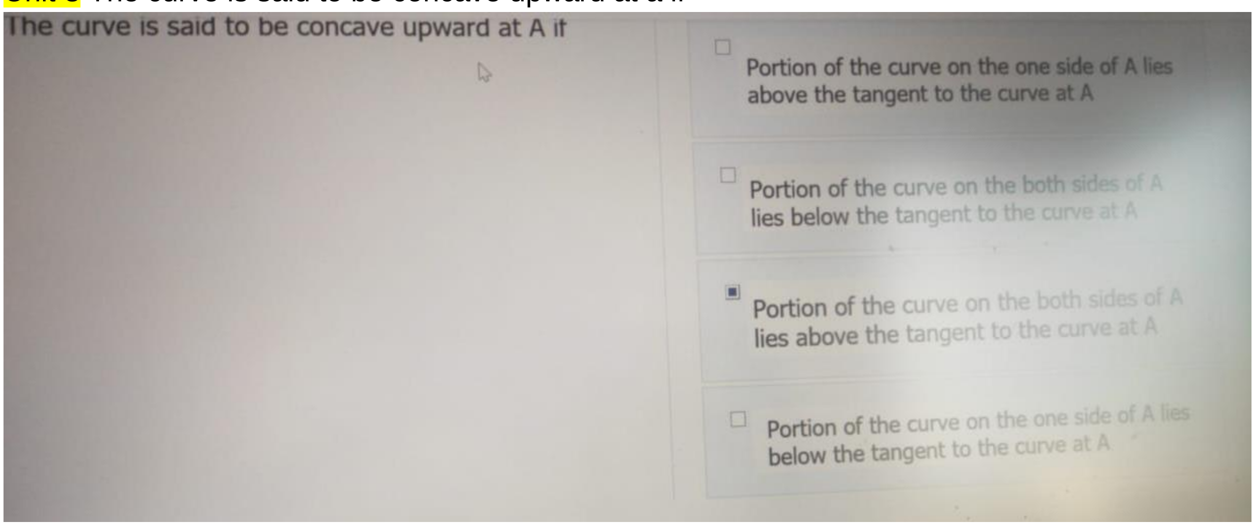
Let P is any point on the curve & if $(\frac{dy}{dx})_p > 0$ then

1 Points Reset Next

- Tangent makes obtuse angle with x
- Tangent parallel to x-axis
- Tangent makes acute angle with x-axis
- Tangent parallel to y-axis

Ans: tangent parallel to y axis

Unit 3 The curve is said to be concave upward at a if

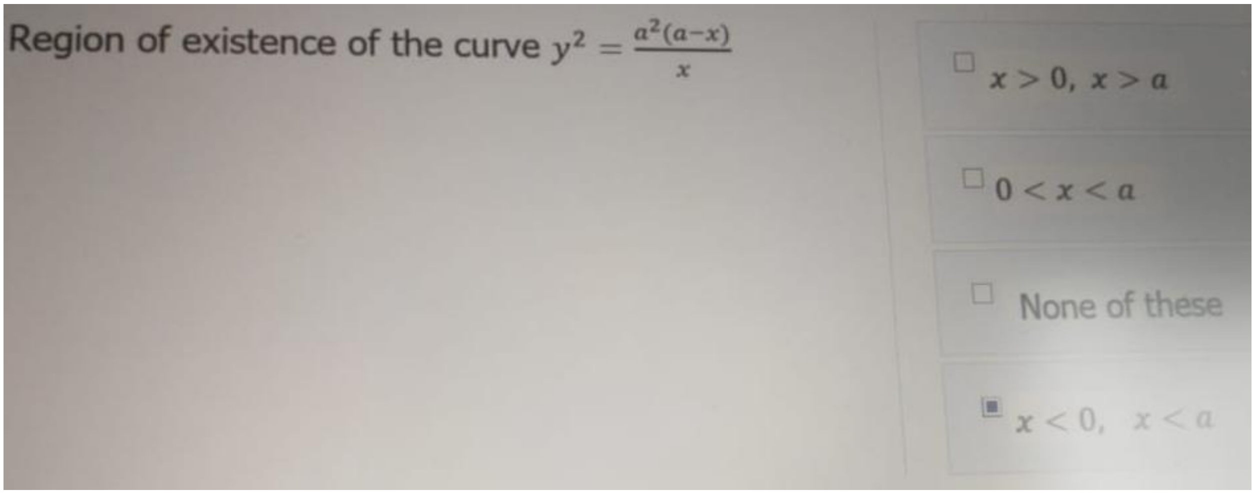


The curve is said to be concave upward at A if

- Portion of the curve on the one side of A lies above the tangent to the curve at A
- Portion of the curve on the both sides of A lies below the tangent to the curve at A
- Portion of the curve on the both sides of A lies above the tangent to the curve at A
- Portion of the curve on the one side of A lies below the tangent to the curve at A

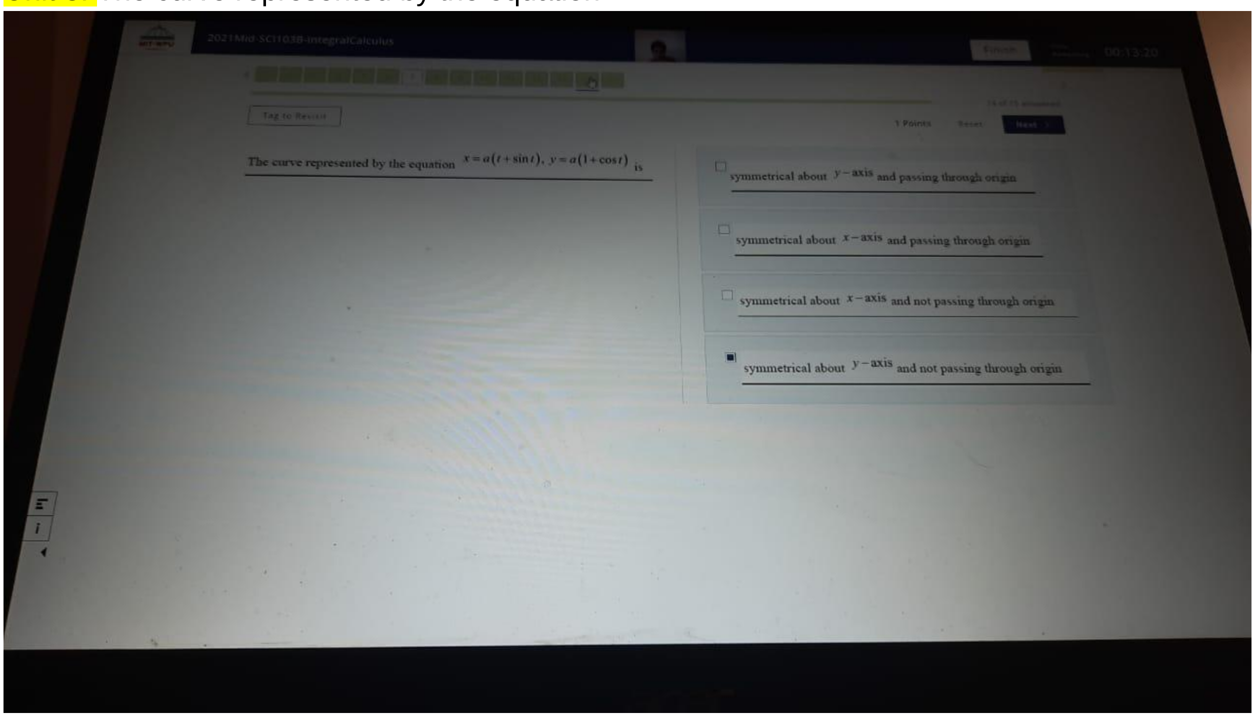
Ans: c

Unit 3 Region of existence



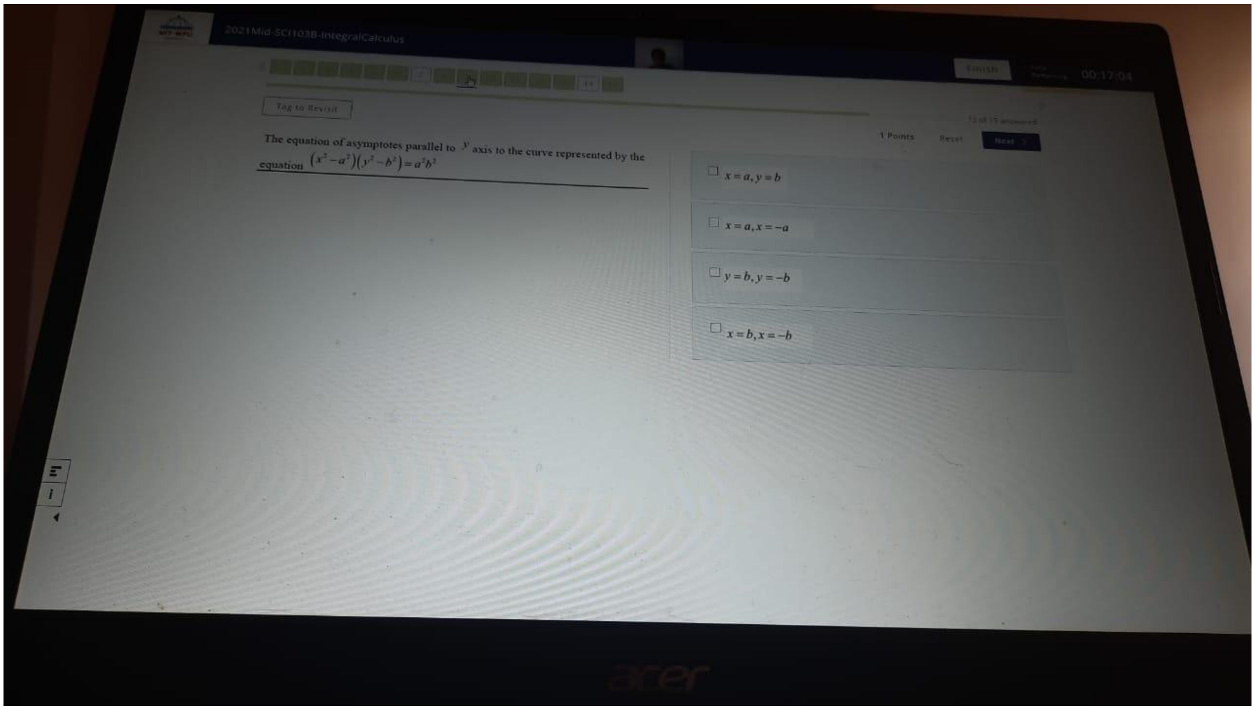
Ans: C kyuki y square 0 bhi ho skta he at x=a

Unit 3: The curve represented by the equation



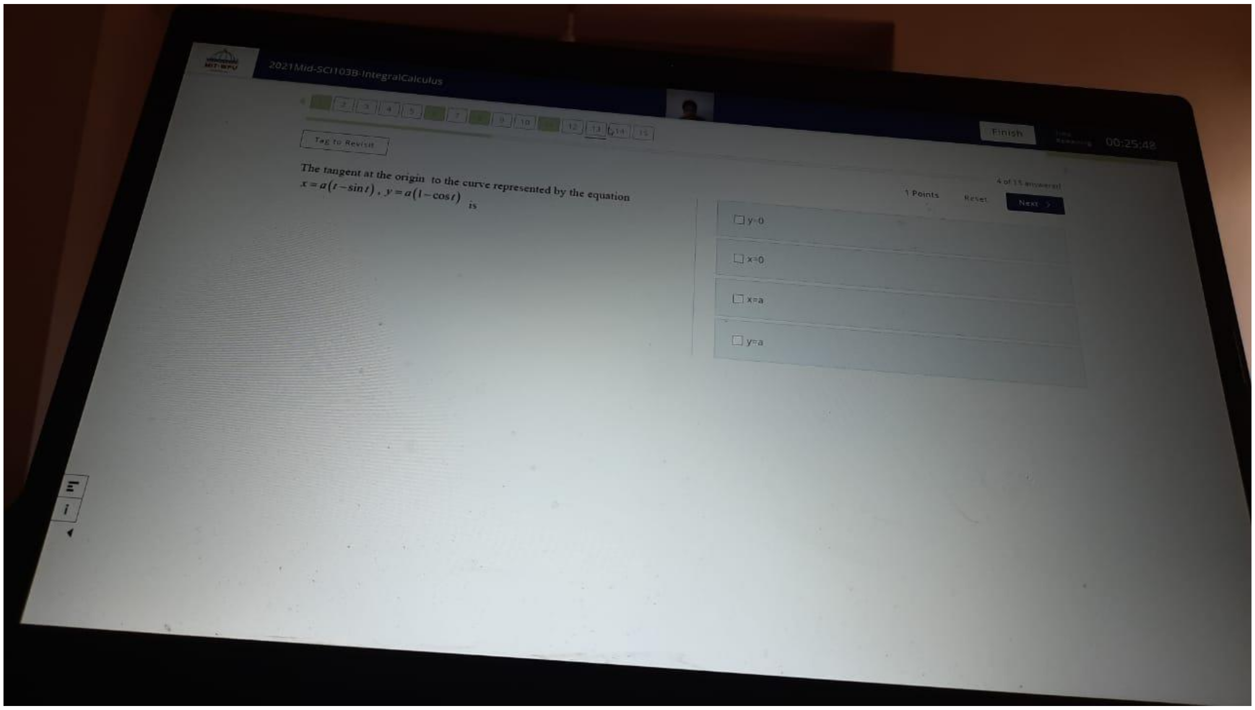
Ans. D

Unit 3 : The equation of asymptotes parallel to y axis to the curve represented by the equation



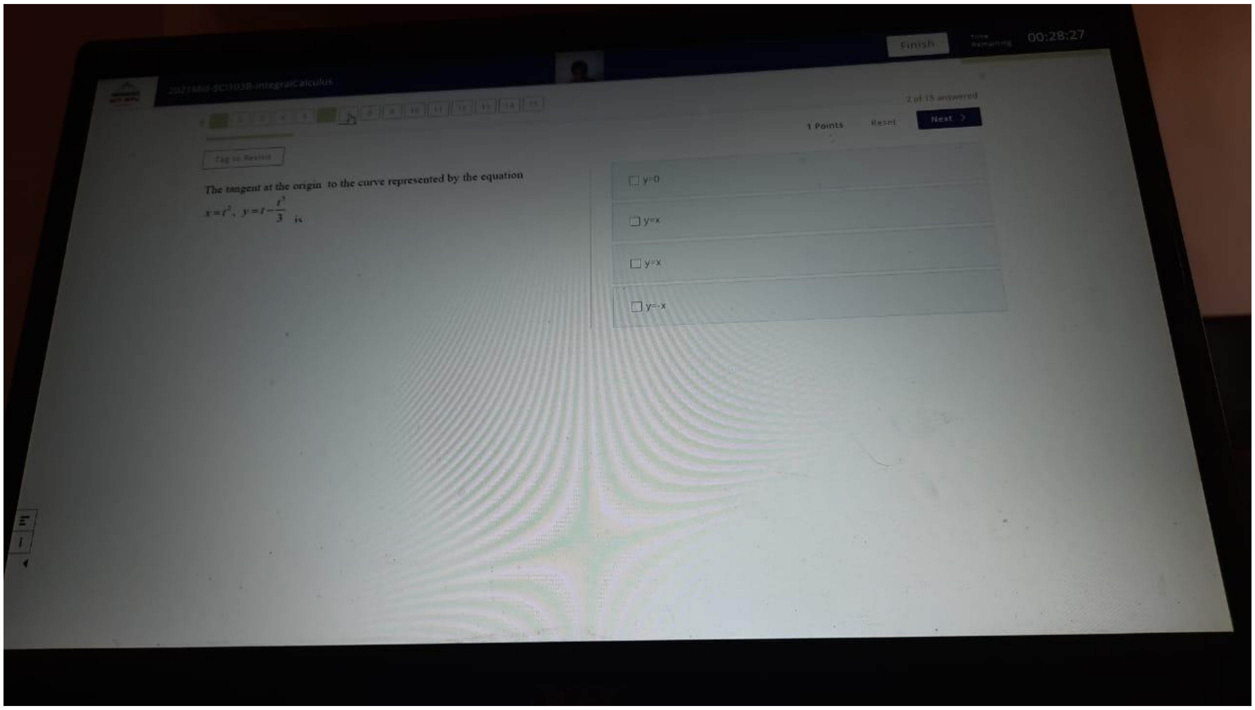
Ans. b

Unit 3 : The tangent at the origin to the curve represented by the equation



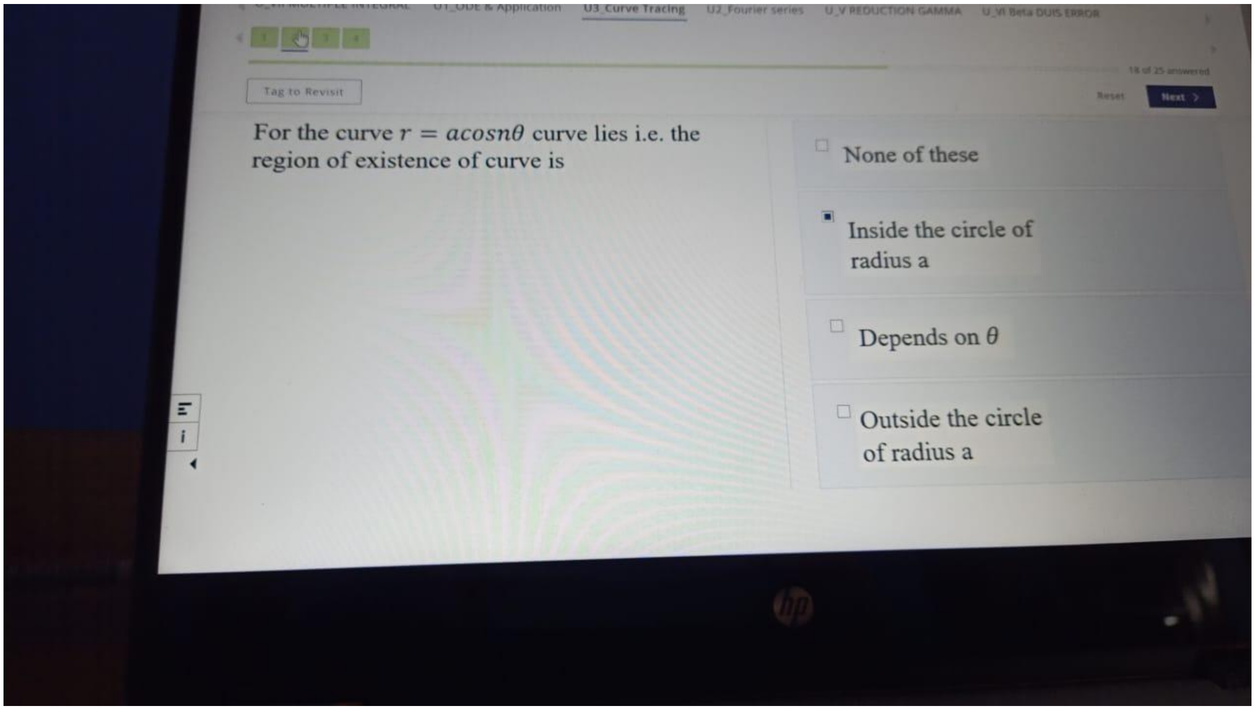
Ans. (option B)

Unit 3 : The tangent at the origin to the curve represented by the equation



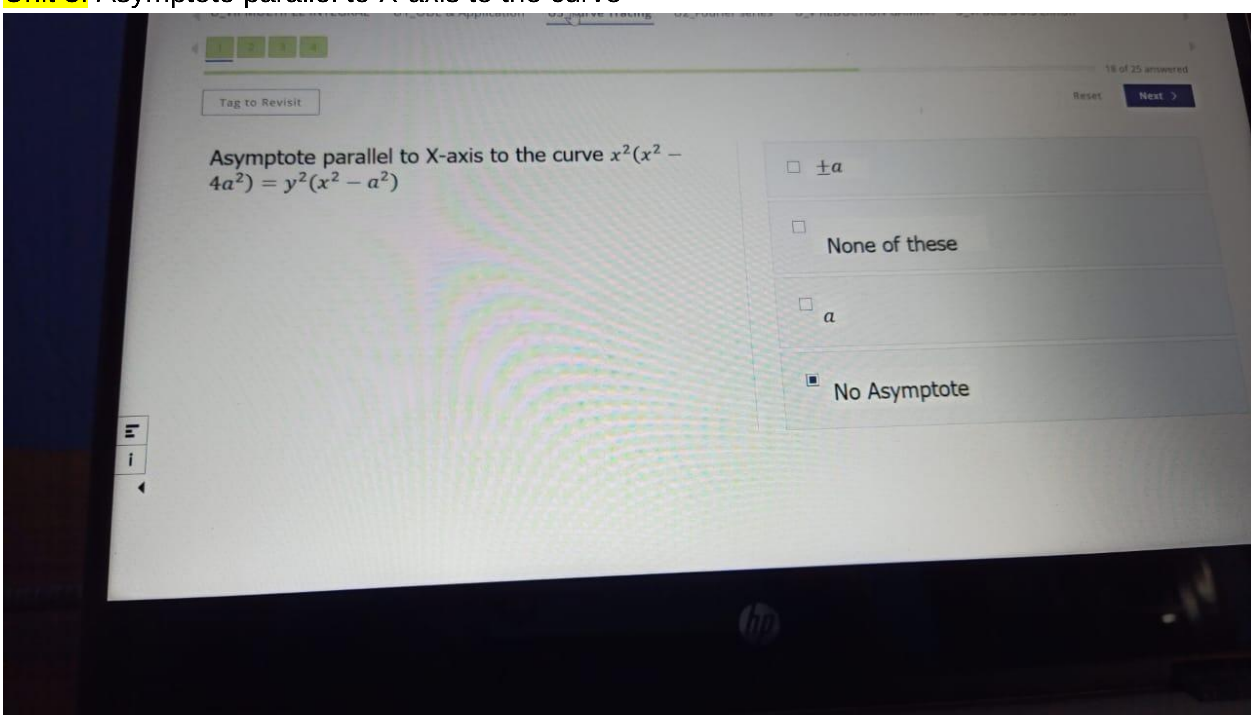
Ans. correct ans not in options : x=0

Unit 3: For curve r= acos(theta) curve lies i.e. the region of existence of curve is



Ans. B

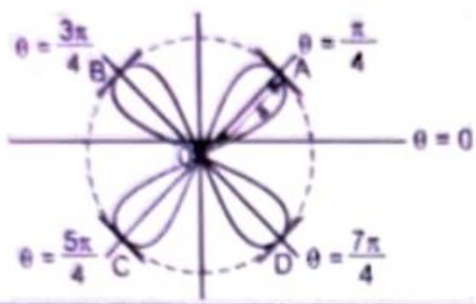
Unit 3: Asymptote parallel to X-axis to the curve



Ans
D

Unit 3: The following figure represents the curve whose equation is

The following figure represents the curve whose equation is



☐ $r = a\sin 2\theta$

☐ $r = a\sin 3\theta$

☐

RESET

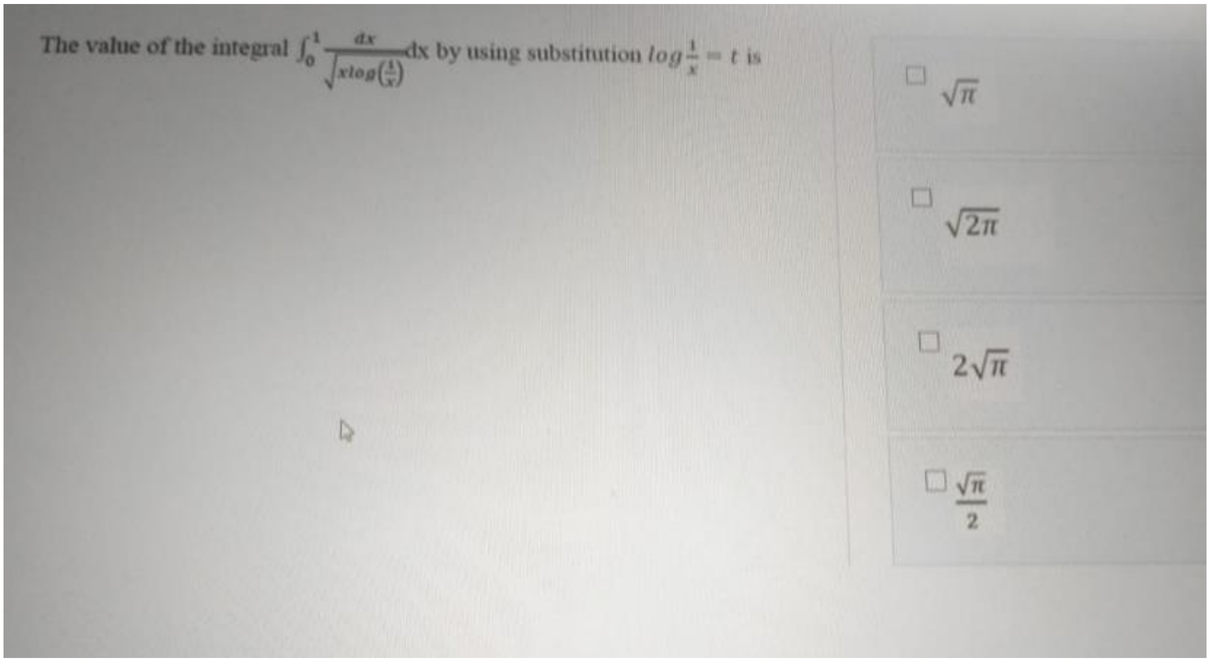
NEXT

Ans: A

Unit: 4

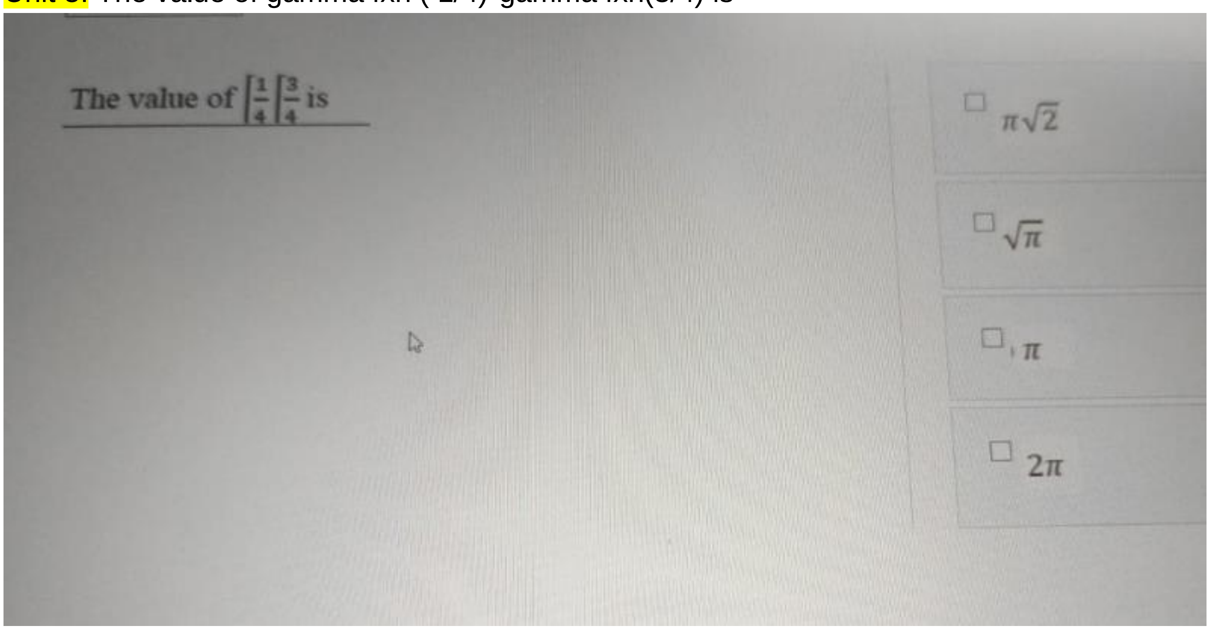
Unit: 5(13 questions)

Unit:5 The value of the integral by using substitution log(1/x)= t



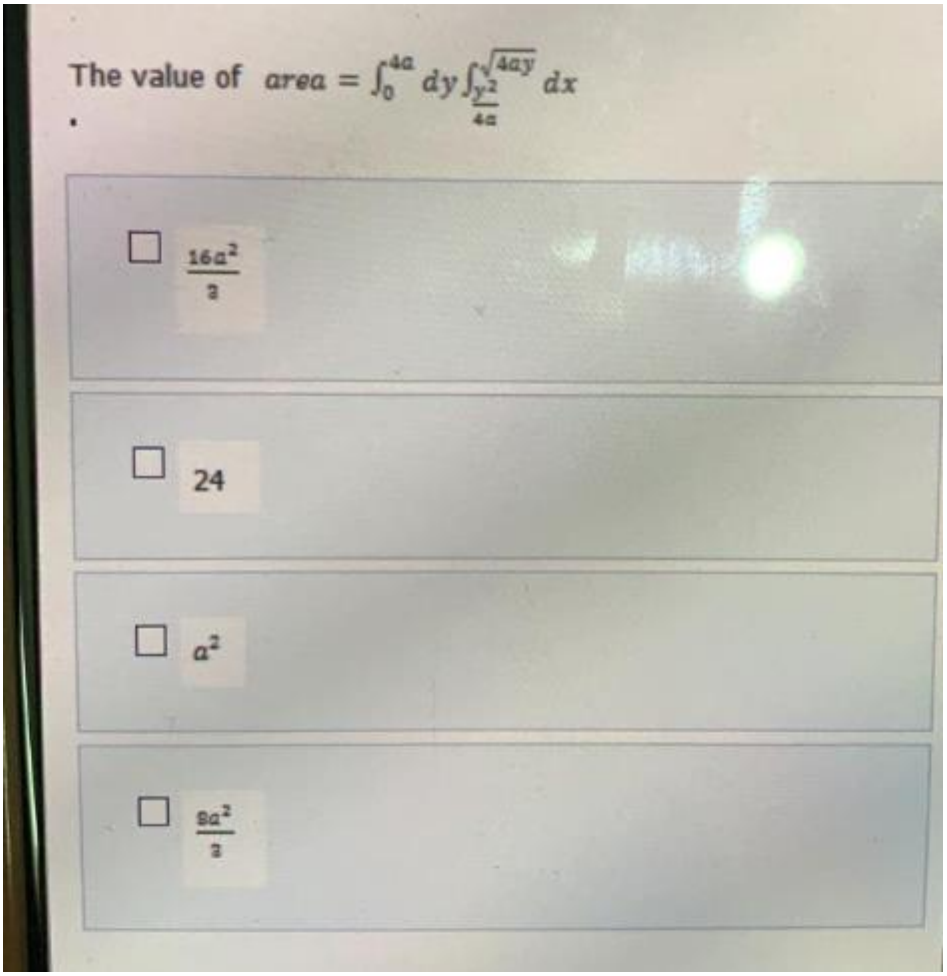
Ans: sqrt(2pi) (option b)

Unit 5: The value of gamma fxn (1/4)*gamma fxn(3/4) is



Ans: option a : pi root(2)

Unit:5 The value of area=



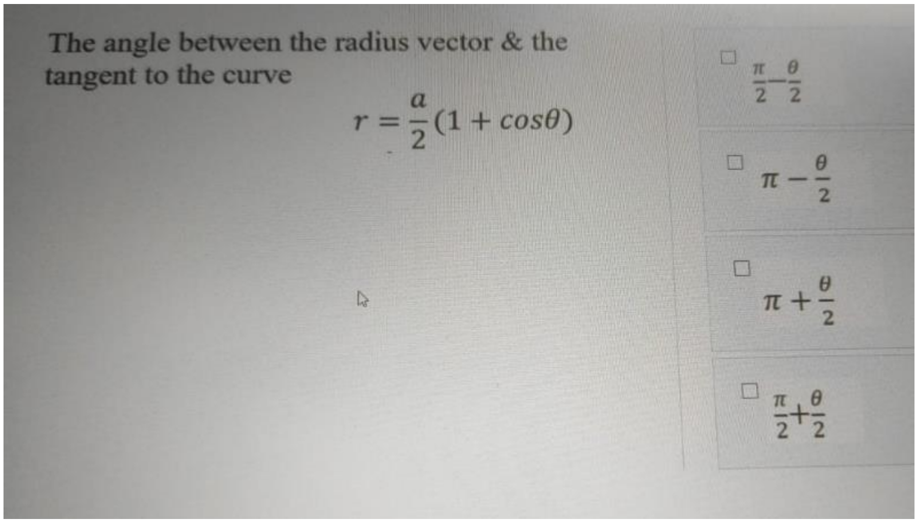
The value of $area = \int_0^{4a} dy \int_{\frac{y^2}{4a}}^{\sqrt{4ay}} dx$

.

- ☐ $\frac{16a^2}{3}$
- ☐ 24
- ☐ a^2
- ☐ $\frac{8a^2}{3}$

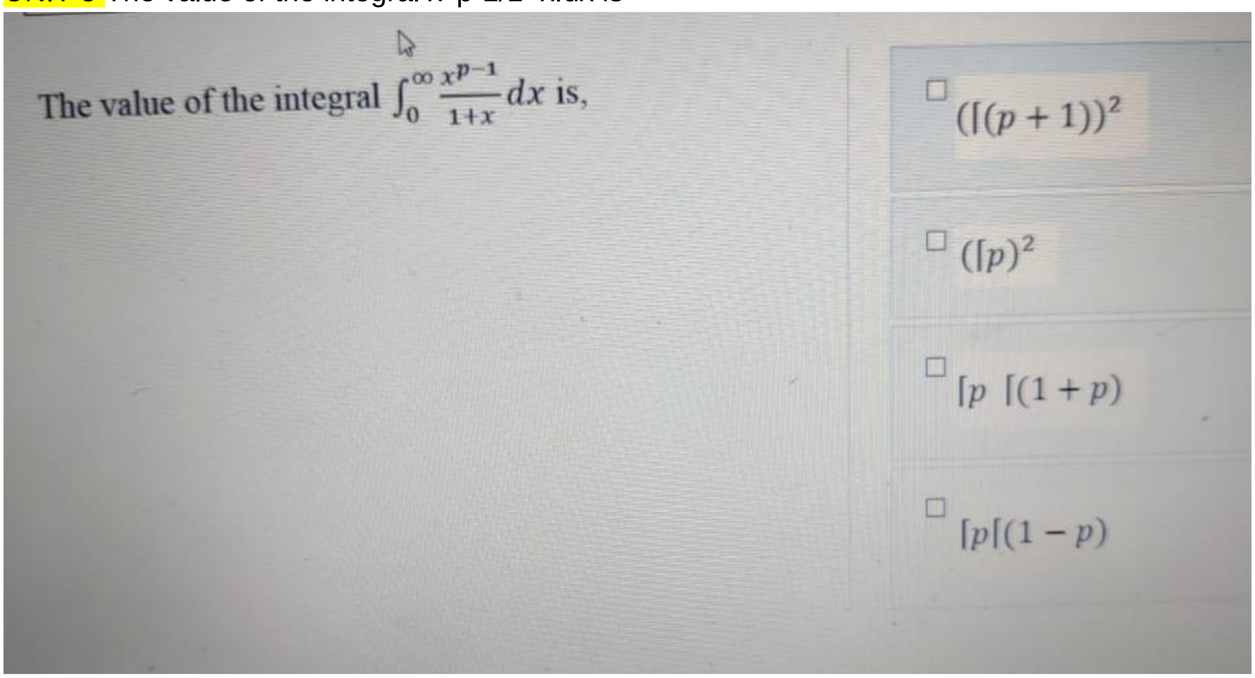
Ans:A

Unit:5 The angle between the radius vector and the tangent to the curve r= a/2(1+cos theta)



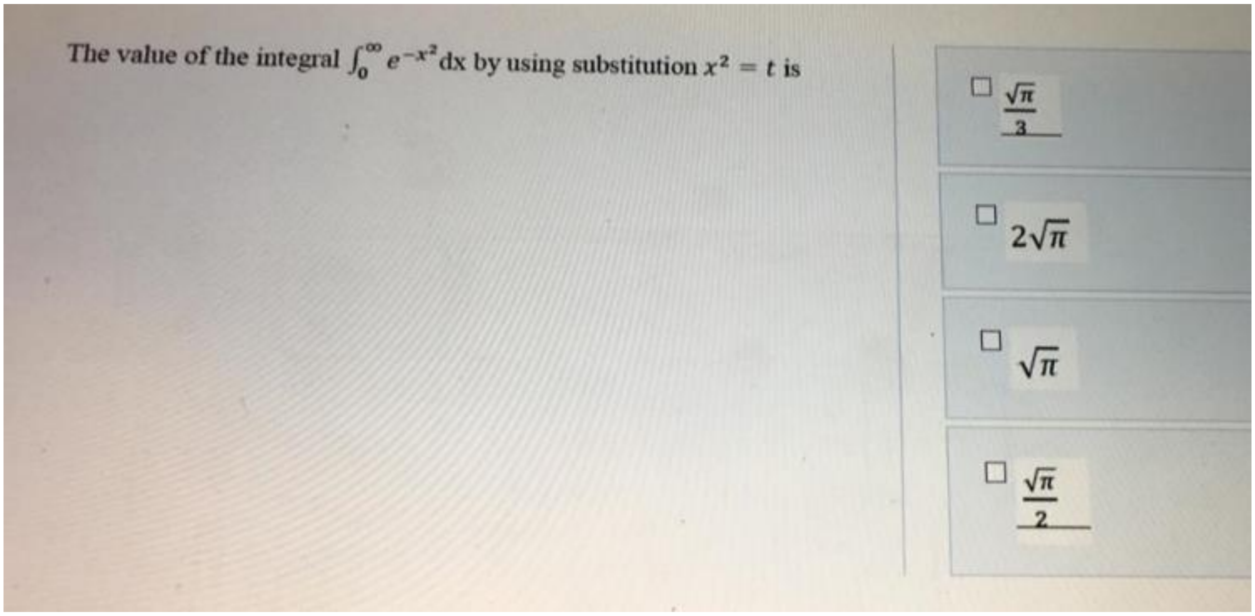
Ans: option A : pi/2-theta/2

UNIT 5 The value of the integral x^p-1/1+x.dx is



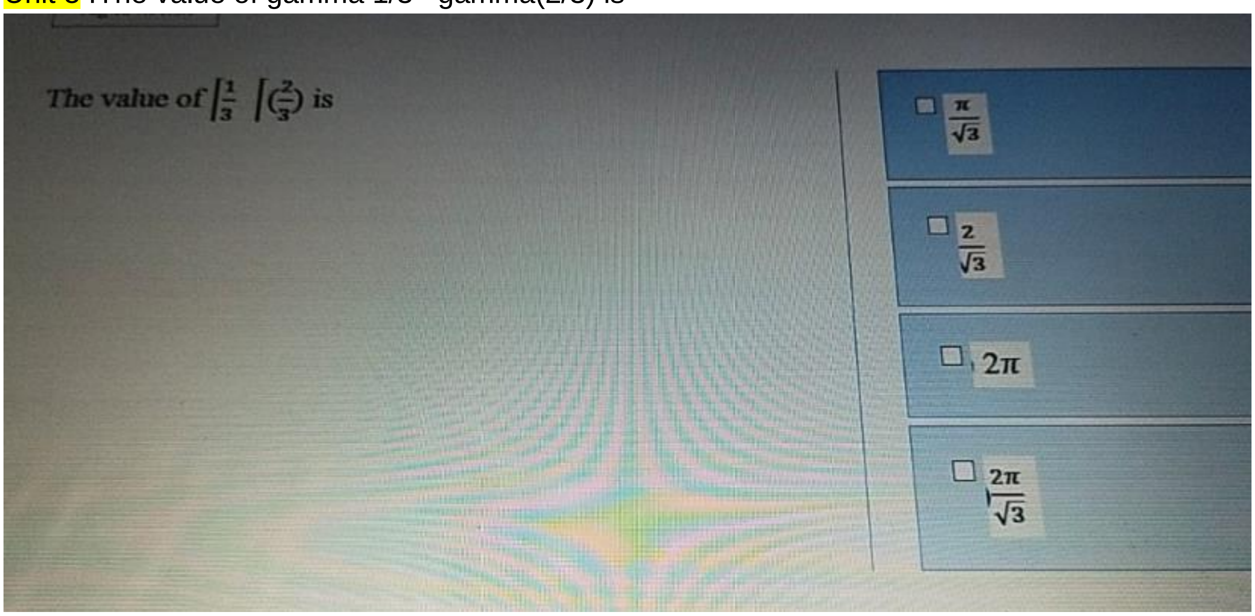
Ans:D [Ꞁ p * Ꞁ 1-p

Unit:5 The value of the integral e^-x2dx by using substitution x^2=t is



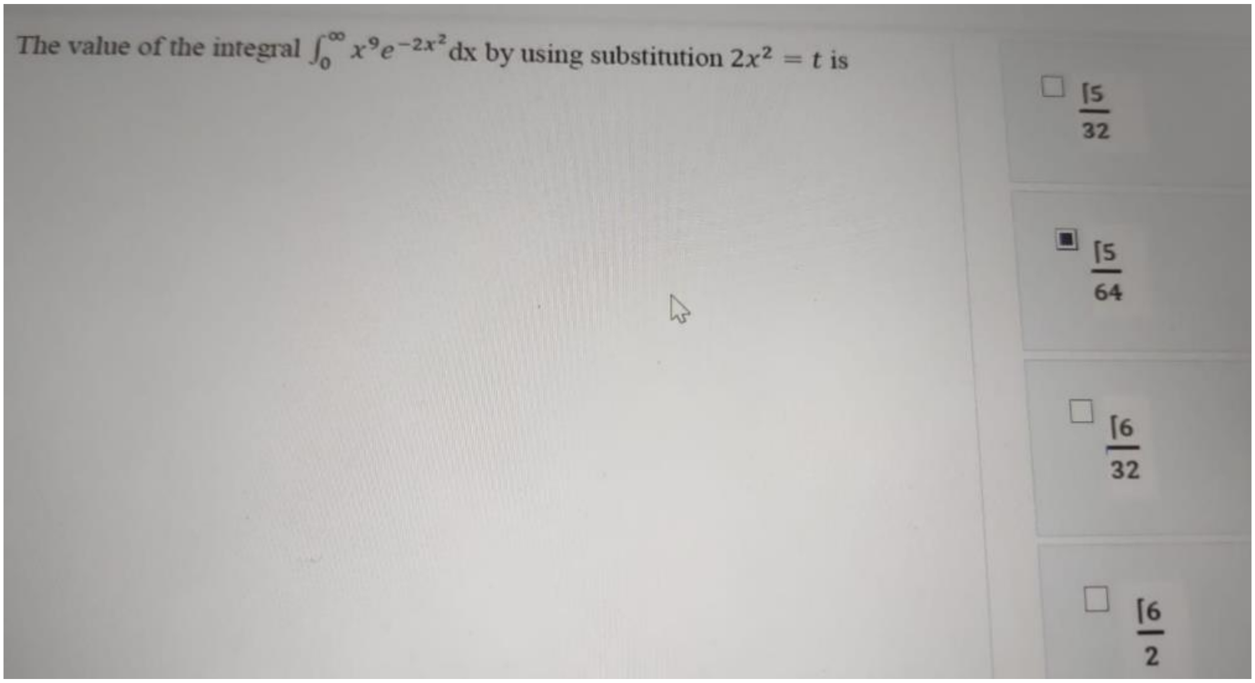
Ans:D

Unit 5 :The value of gamma 1/3 gamma(2/3) is



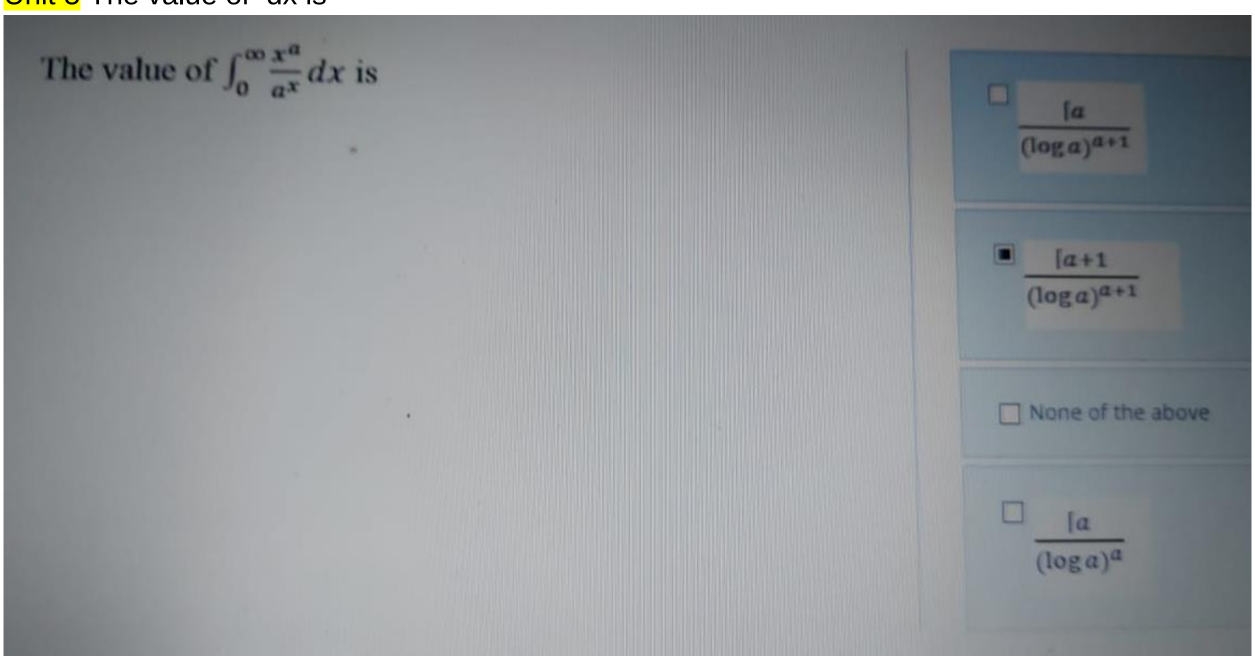
Ans: d 2pi/root 3

Unit 5 The value of the integral



Ans: 5/64

Unit 5 The value of dx is



Ans: B

Unit 5 The value of the integral by using substitution

The value of the integral $\int_0^1 x^{m-1}(1-x^2)^{n-1}\,dx$ by using substitution x=$\sqrt{t}$ is

- [ ] $B\left(\frac{m}{2},n\right)$
- [ ] $B\left(\frac{m-1}{2},n-1\right)$
- [ ] $\frac{1}{2}B\left(\frac{m}{2},n\right)$
- [x] $\frac{1}{2}B\left(\frac{m-1}{2},n-1\right)$

Ans: C

Unit:5 The value of integral by using substitution method

The value of the integral $\int_0^1 (1-x^{1/n})^m\,dx$ by using substitution $x^{1/n}=t$ is

$\int_0^1 (1-x^{1/n})^m$

$B(n,m+1)$

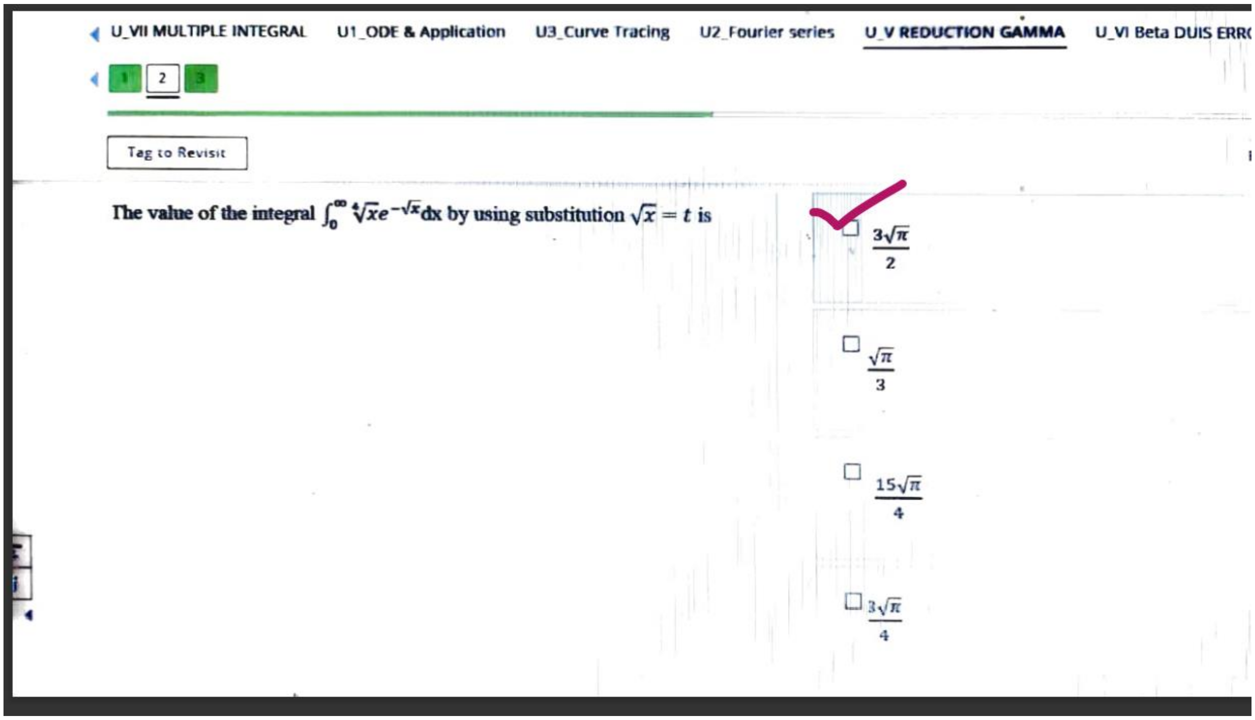
$mB(m,n+1)$

✓ $nB(n,m+1)$

$B(m,n+1)$

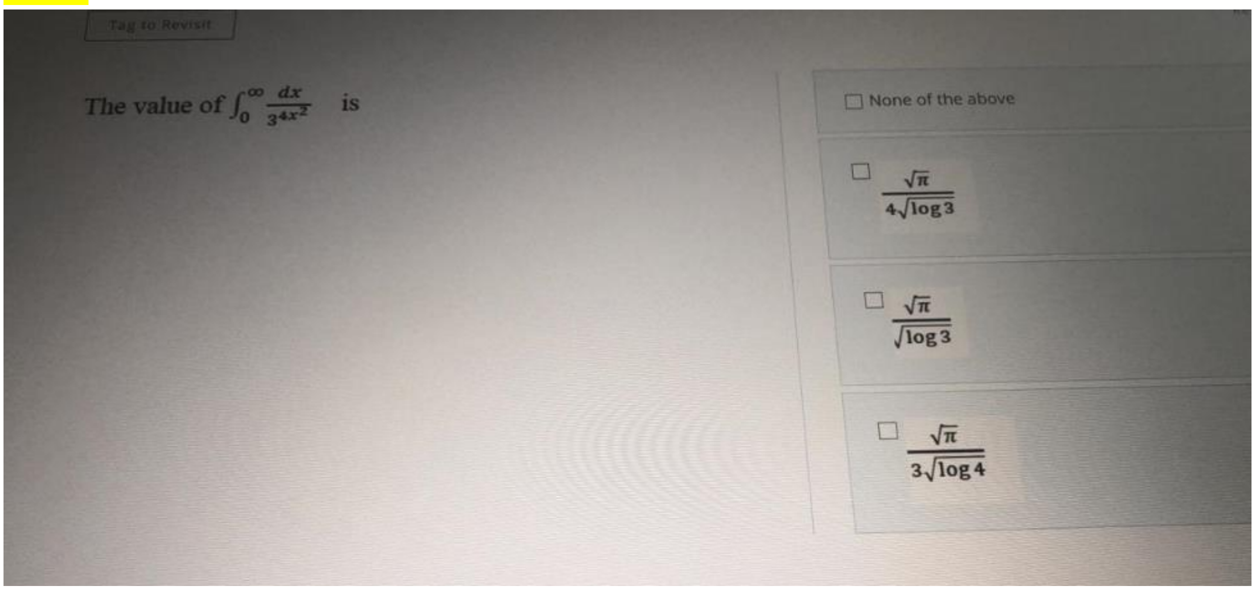
Ans:C

Unit 5 The value of the integral by using substitution



Ans: A

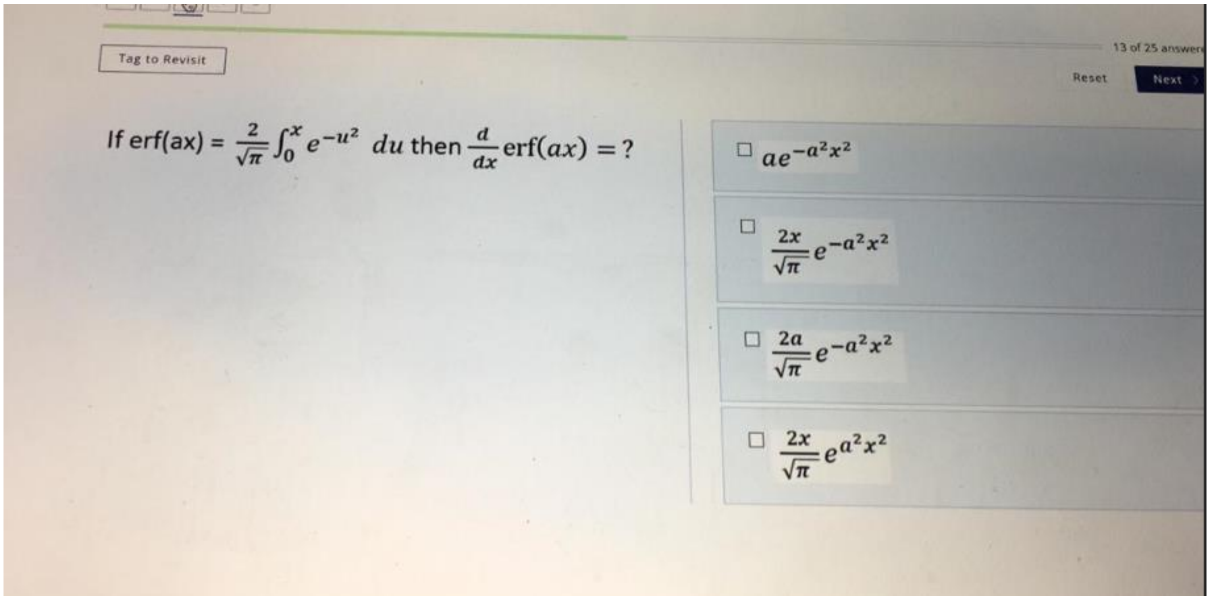
Unit 5: The value of dx/3^4x2



Ans: B

Unit: 6 (34 Questions)

Unit:6 If erf(ax)=2/root pi … then d/dx erf(ax) =?

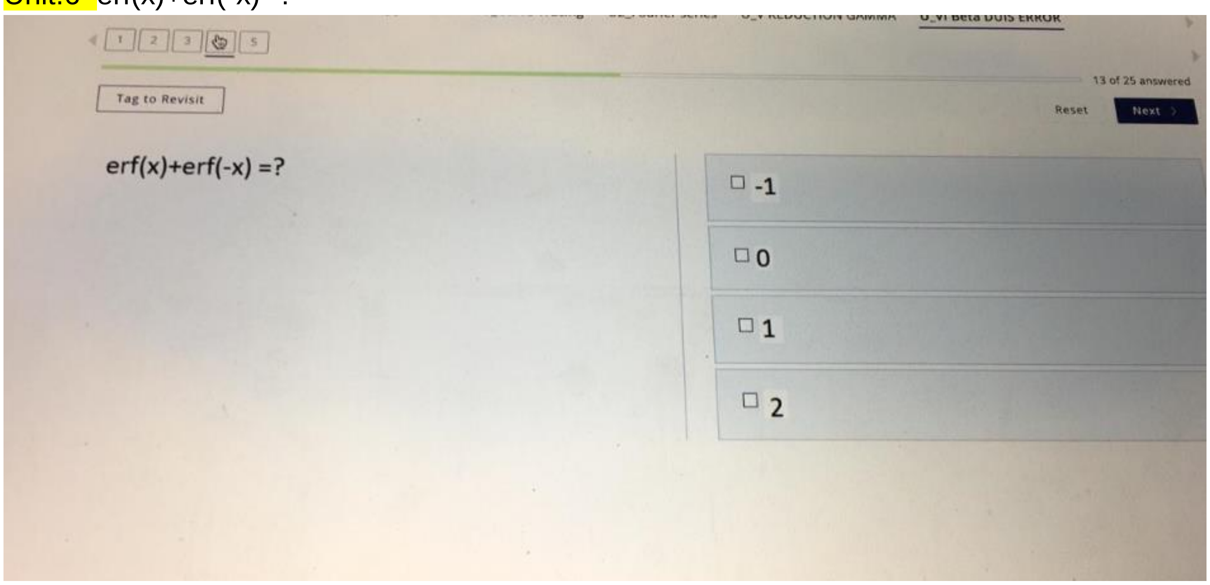


Example 54. *Prove that*

$$\frac{d}{dx}[erf_c(\alpha\, x)] = \frac{-2a}{\sqrt{\pi}}e^{-\alpha^2 x^2}$$

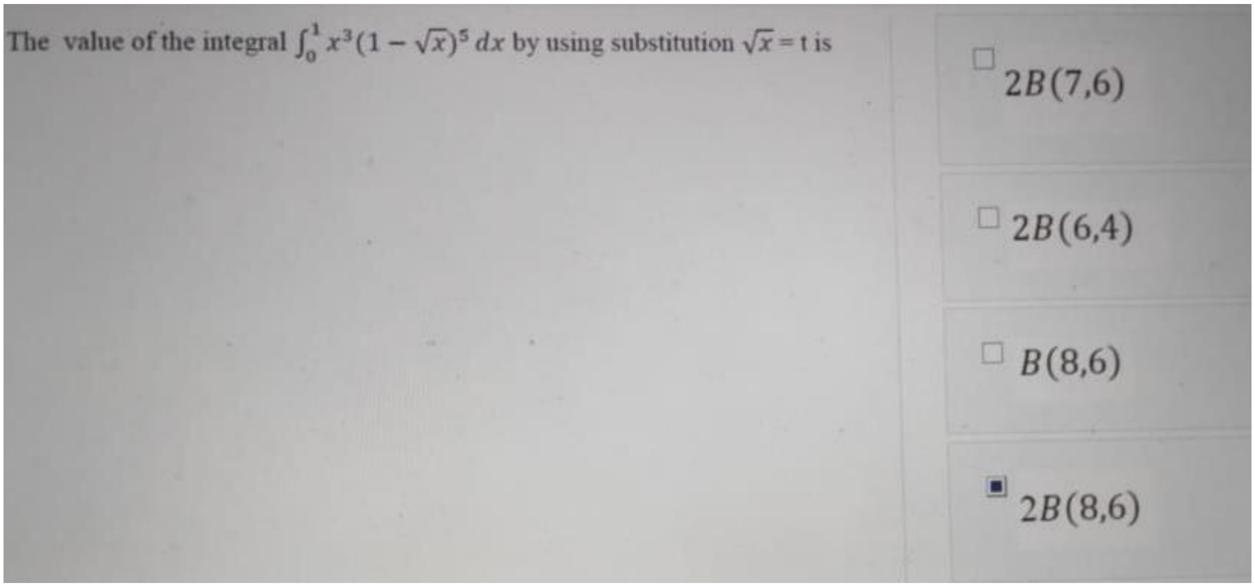
Ans:

Unit:6 erf(x)+erf(-x)=?



Ans: option B (= 0) (Erf is odd function)

Unit 6: The value of the integral ... by using substitution root(x)= t

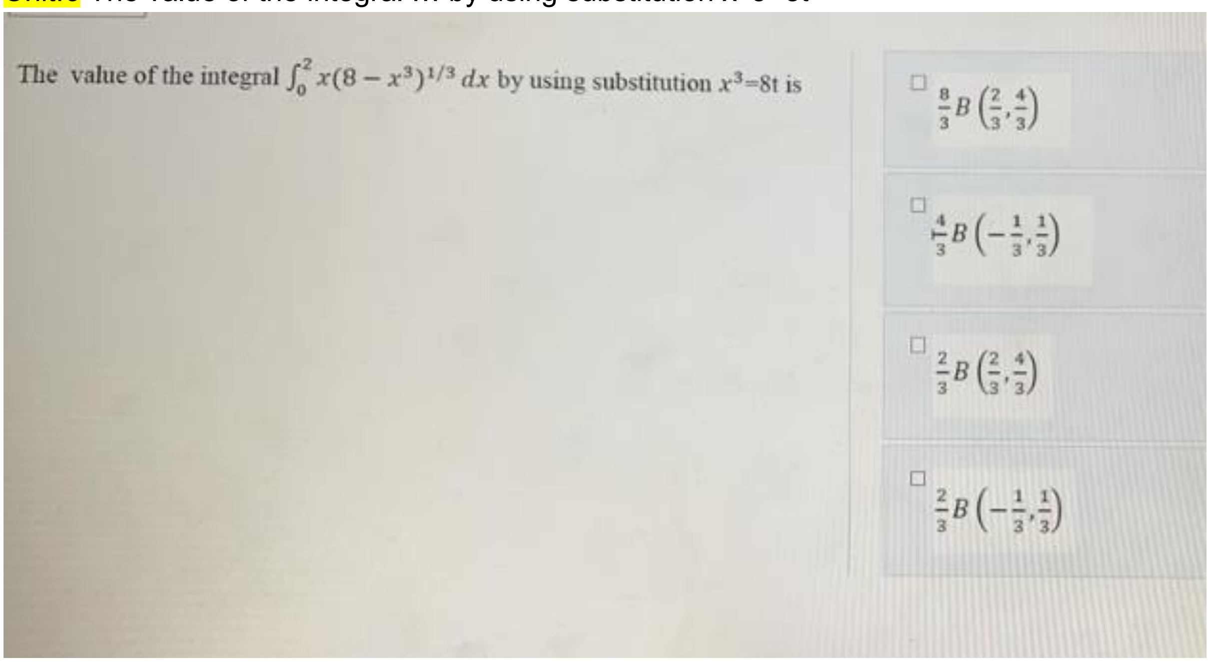


The value of the integral $\int_0^1 x^3(1-\sqrt{x})^5\,dx$ by using substitution $\sqrt{x}=$ t is

- ☐ $2B(7,6)$
- ☐ $2B(6,4)$
- ☐ $B(8,6)$
- ■ $2B(8,6)$

Ans: 2B(8,6)

Unit:6 The value of the integral … by using substitution x^3=8t

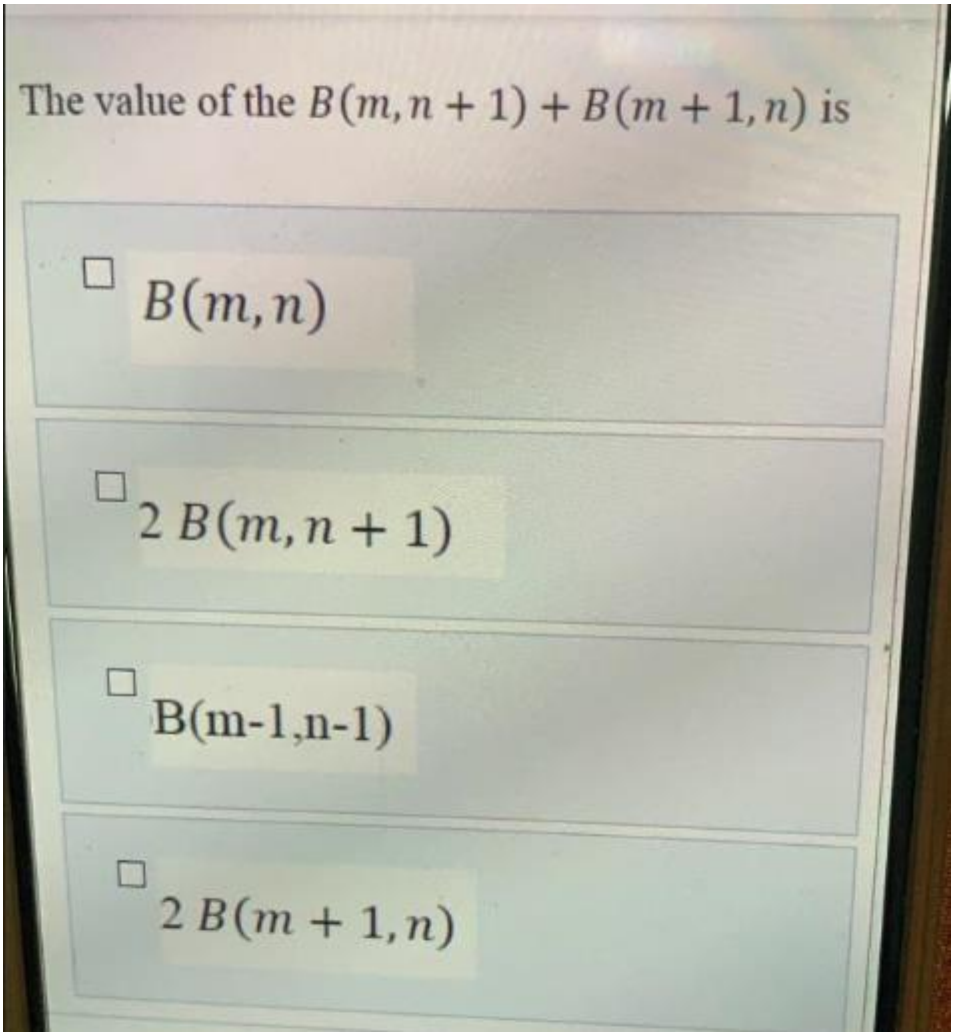


The value of the integral $\int_0^2 x(8-x^3)^{1/3}\,dx$ by using substitution x^3=8t is

- ☐ $\frac{8}{3}B\left(\frac{2}{3},\frac{4}{3}\right)$
- ☐ $\frac{4}{3}B\left(-\frac{1}{3},\frac{1}{3}\right)$
- ☐ $\frac{2}{3}B\left(\frac{2}{3},\frac{4}{3}\right)$
- ☐ $\frac{2}{3}B\left(-\frac{1}{3},\frac{1}{3}\right)$

Ans: option A (8/3)(B(2/3,4/3))

Unit 6: The value of the B(m,n+1) + B(m+1, n)



The value of the $B(m, n+1) + B(m+1, n)$ is

☐ $B(m, n)$

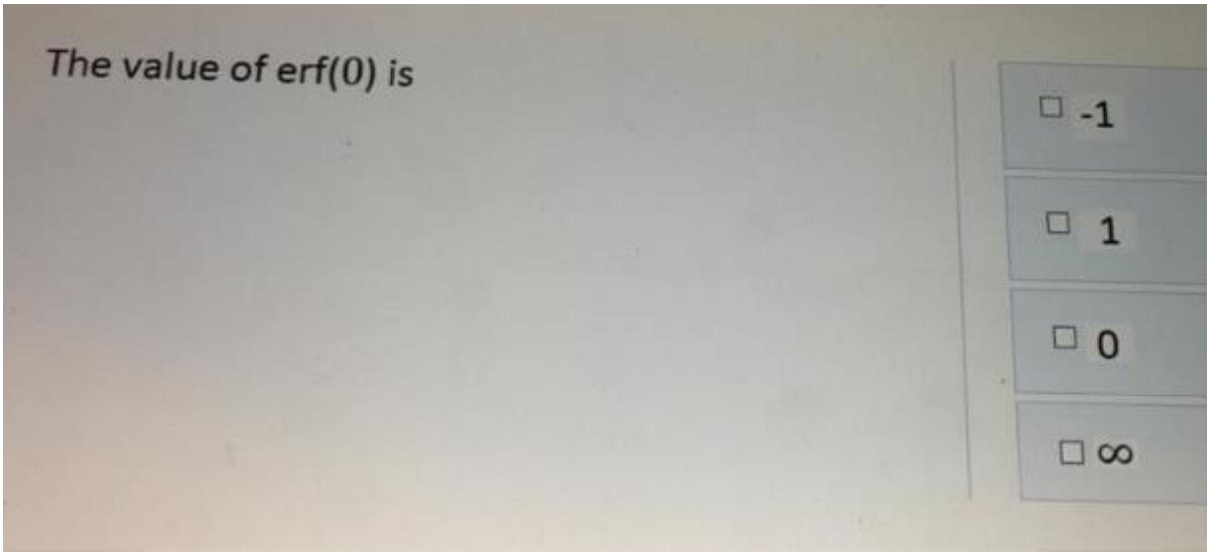
☐ $2\,B(m, n+1)$

☐ B(m-1,n-1)

☐ $2\,B(m+1, n)$

Ans: A (B(m,n))

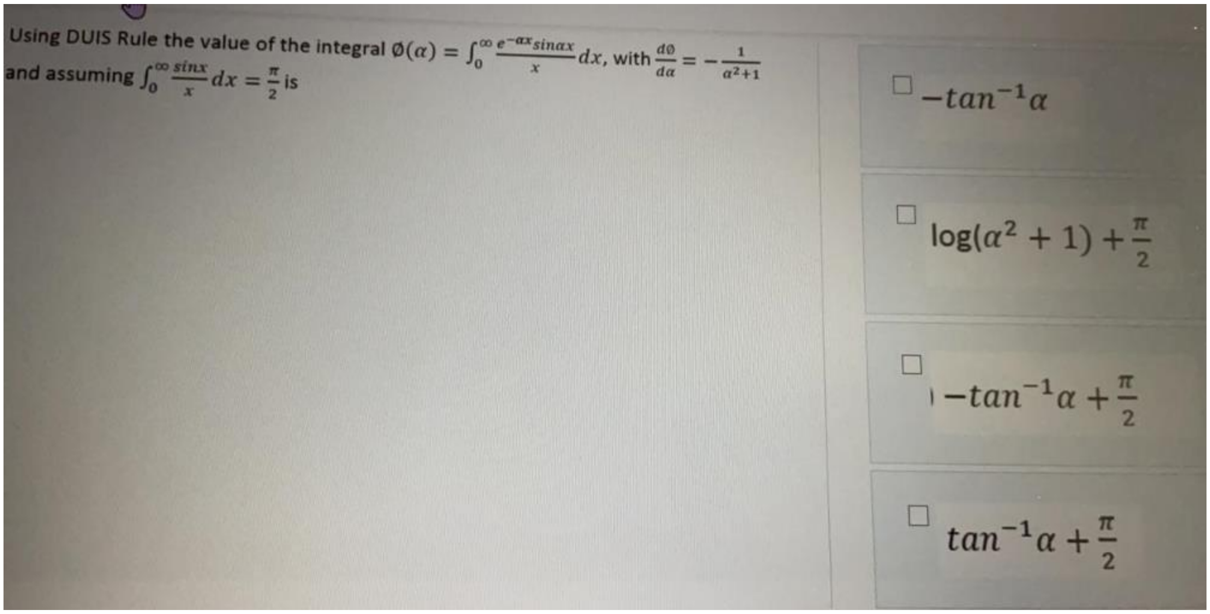
Unit:6 The Value of erf(0) is


The value of erf(0) is

- -1
- 1
- 0
- ∞

Ans: C (0)

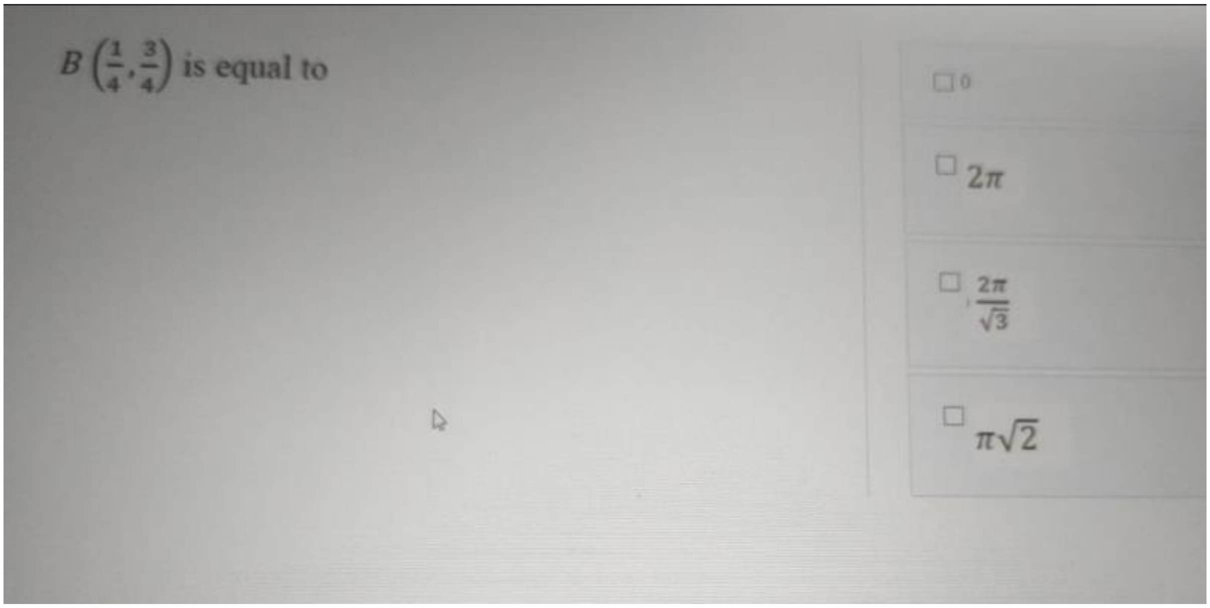
Unit 6: Using the DUIS rule the value of


Using DUIS Rule the value of the integral $\emptyset(\alpha) = \int_0^\infty \frac{e^{-\alpha x} \sin \alpha x}{x} dx$, with $\frac{d\emptyset}{d\alpha} = -\frac{1}{\alpha^2+1}$ and assuming $\int_0^\infty \frac{\sin x}{x} dx = \frac{\pi}{2}$ is

- $-\tan^{-1}\alpha$
- $\log(\alpha^2+1) + \frac{\pi}{2}$
- $-\tan^{-1}\alpha + \frac{\pi}{2}$
- $\tan^{-1}\alpha + \frac{\pi}{2}$

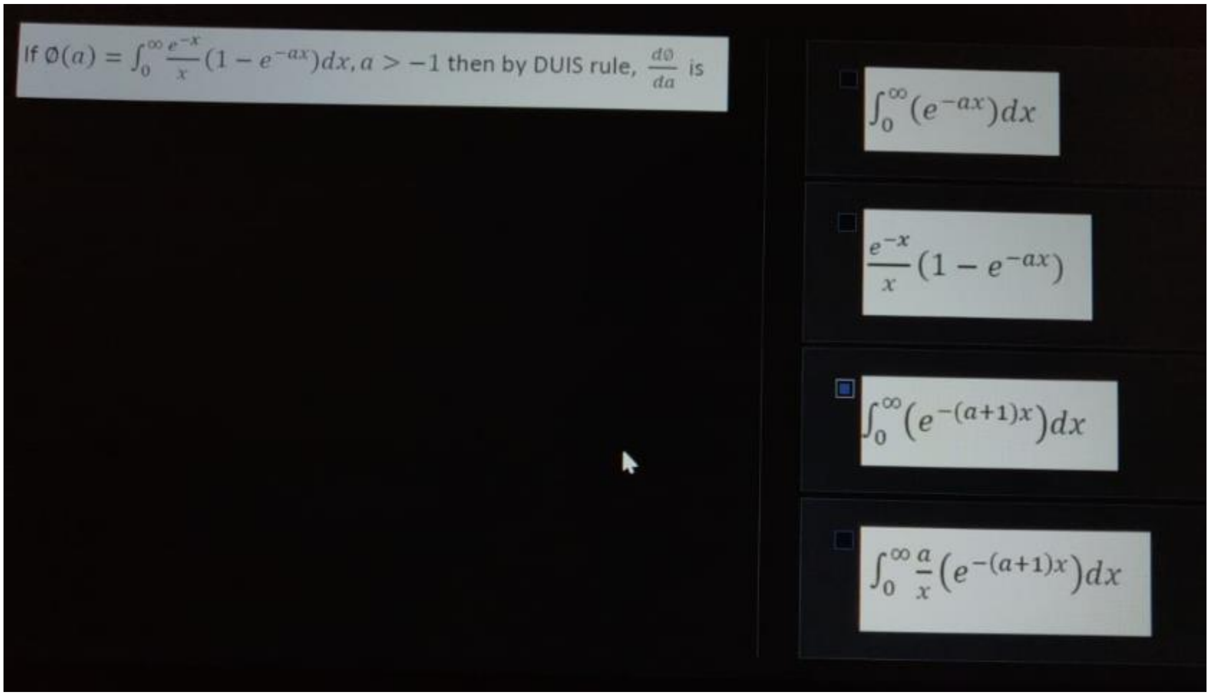
Ans: option a

Unit 6: B(¼ ,¾) is equal to



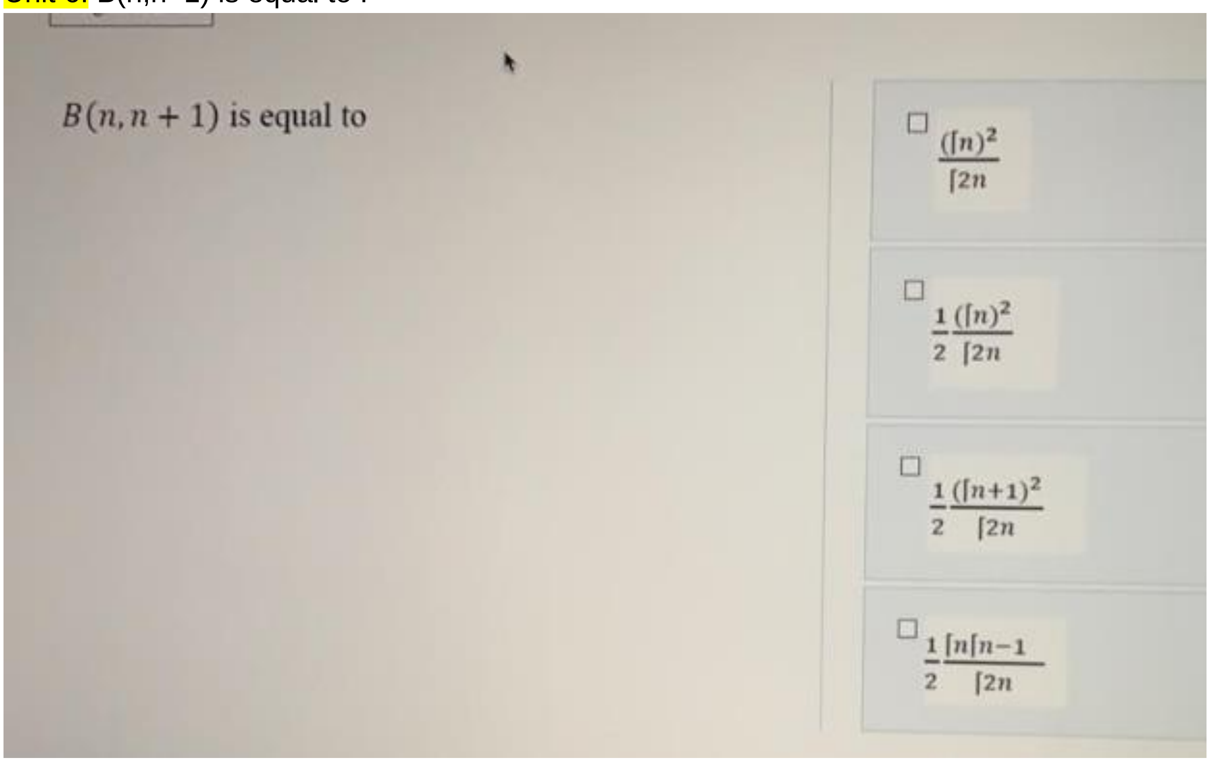
Ans: option D root 2 pi

Unit 6: IF (1-e^-ax)dx, a>-1 then by DUIS rule, dtheta/da



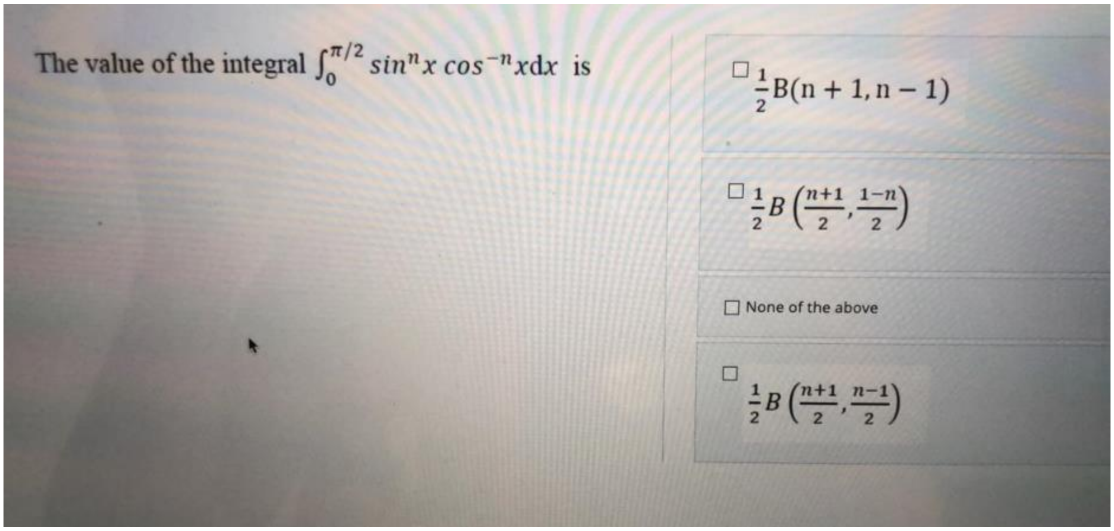
Ans: D

Unit 6: B(n,n+1) is equal to :



Ans: **B**

Unit 6: The value of integral sin^n x cos^-n x dx is

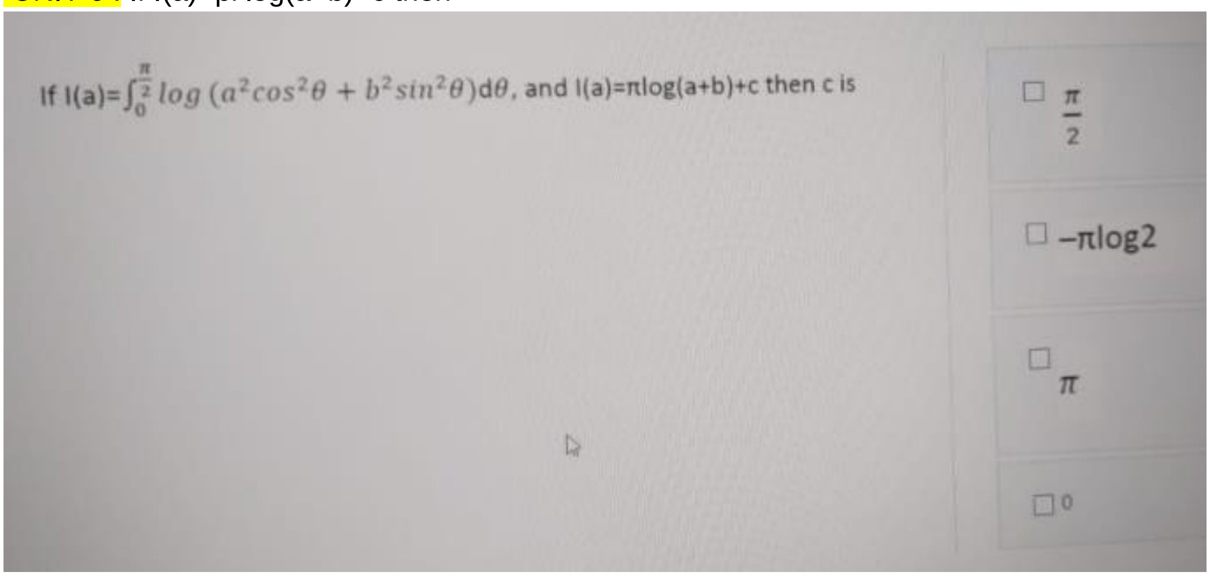


The value of the integral $\int_0^{\pi/2} sin^n x \, cos^{-n} x dx$ is

- $\frac{1}{2}B(n+1, n-1)$
- $\frac{1}{2}B\left(\frac{n+1}{2}, \frac{1-n}{2}\right)$
- None of the above
- $\frac{1}{2}B\left(\frac{n+1}{2}, \frac{n-1}{2}\right)$

Ans: option B : ½ B ((n+1)/2 , (1-n)/2)

UNIT 6 : If I(a)=pi log(a+b)+c then

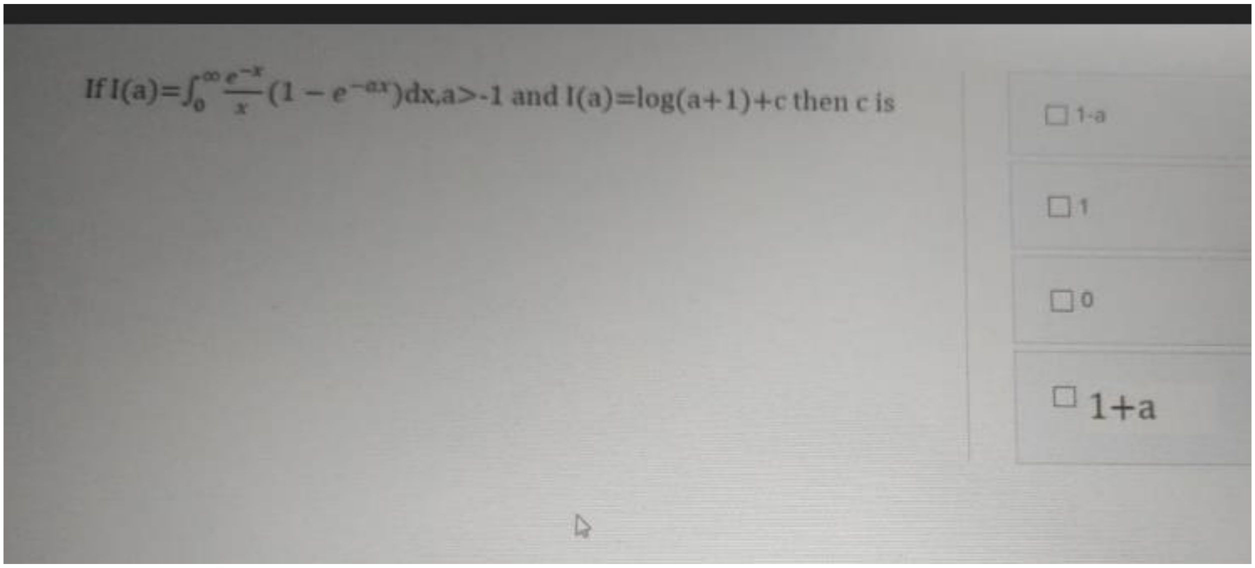


If I(a)=$\int_0^{\frac{\pi}{2}} log\,(a^2cos^2\theta + b^2sin^2\theta)d\theta$, and I(a)=πlog(a+b)+c then c is

- $\frac{\pi}{2}$
- −πlog2
- π
- 0

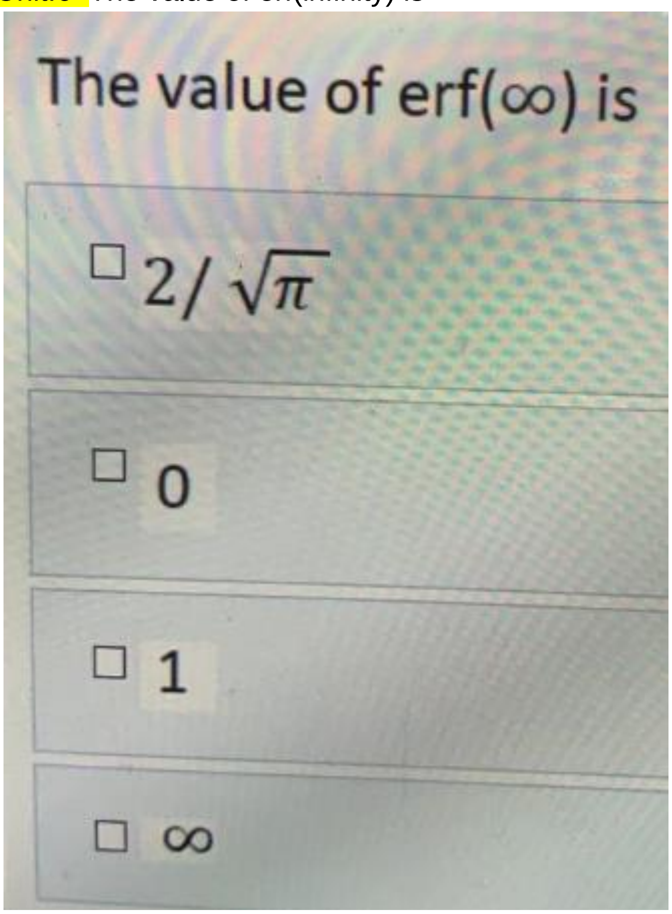
Ans: B (-pi log2)

UNIT 6 If I(A) = log(a+1)+c is



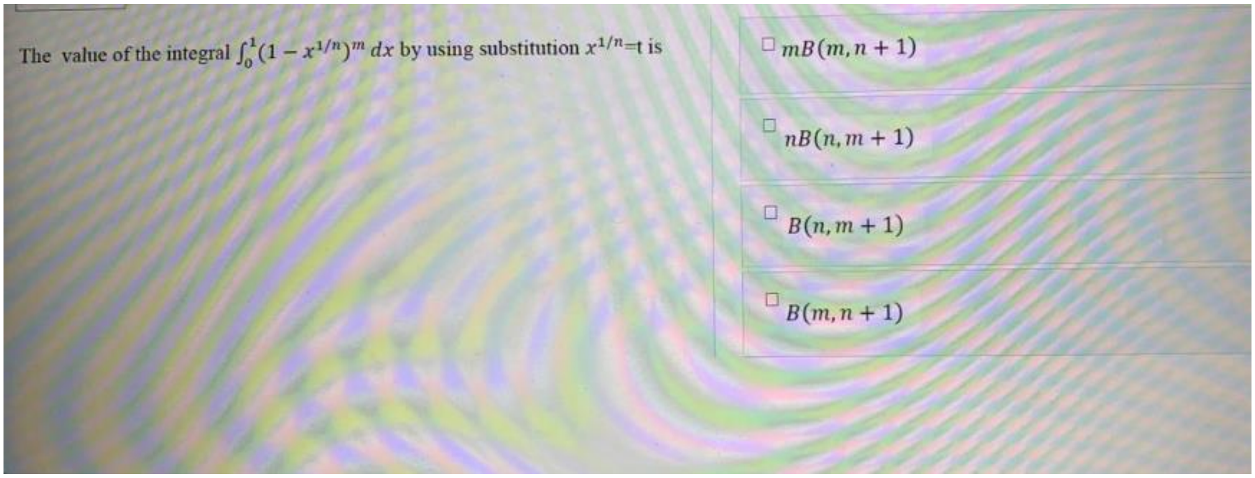
Ans: 0

Unit:6 The value of erf(infinity) is



Ans : C

Unit:6 The value of integral by using substitution x^1/n=t is

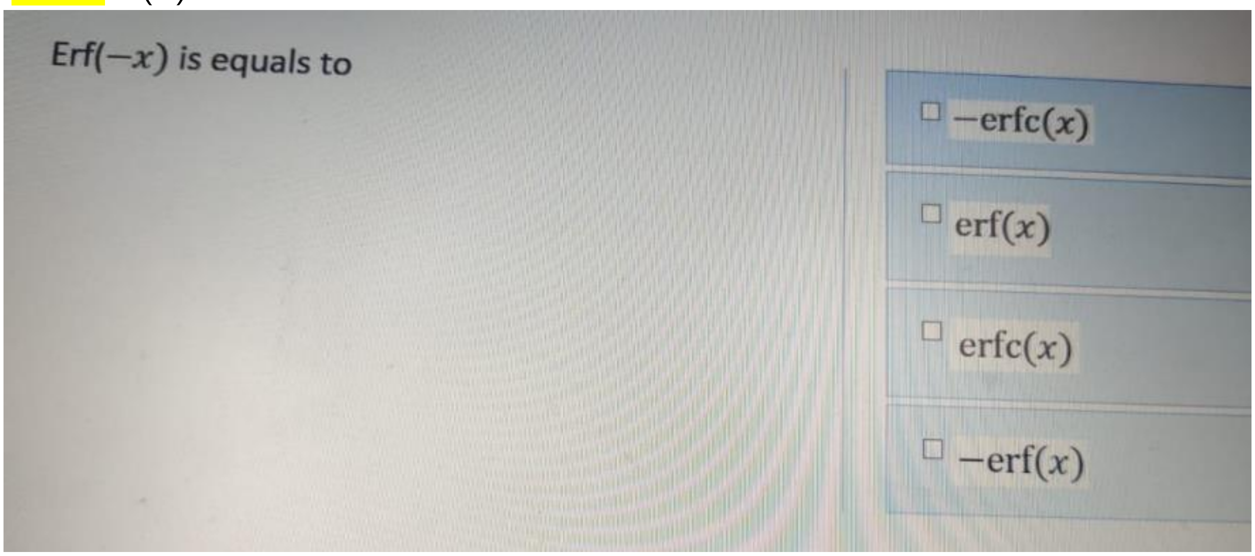


The value of the integral $\int_0^1 (1 - x^{1/n})^m \, dx$ by using substitution $x^{1/n}$=t is

- $mB(m, n+1)$
- $nB(n, m+1)$
- $B(n, m+1)$
- $B(m, n+1)$

Ans: B

Unit:6 Erf(-x)

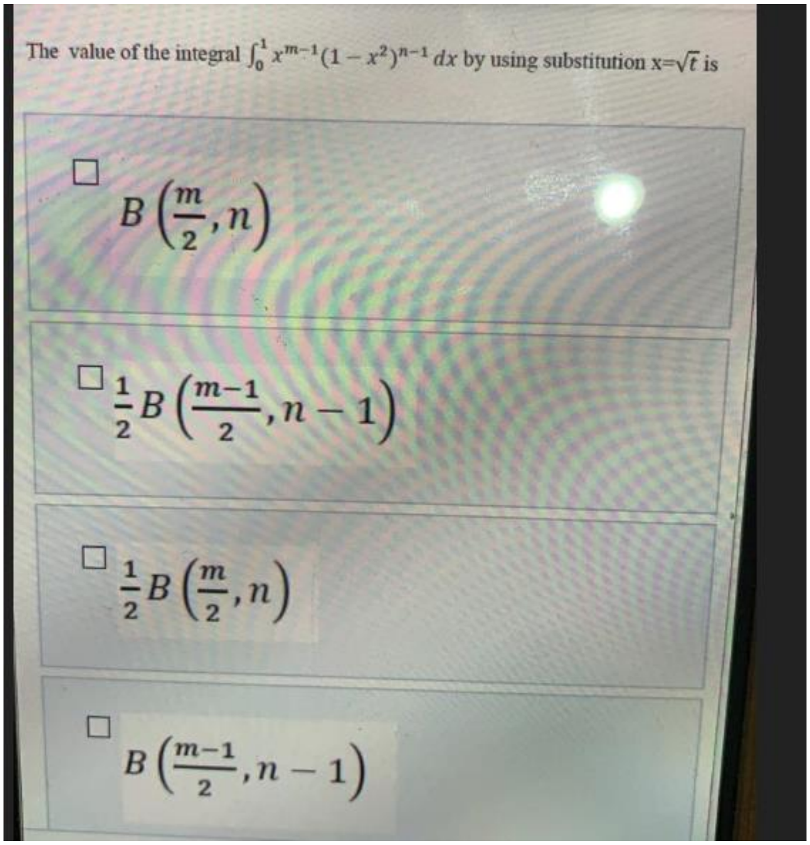


Erf($-x$) is equals to

- $-\text{erfc}(x)$
- $\text{erf}(x)$
- $\text{erfc}(x)$
- $-\text{erf}(x)$

Ans: D

Unit:6 The value of the integral by using substitution x=root(t)

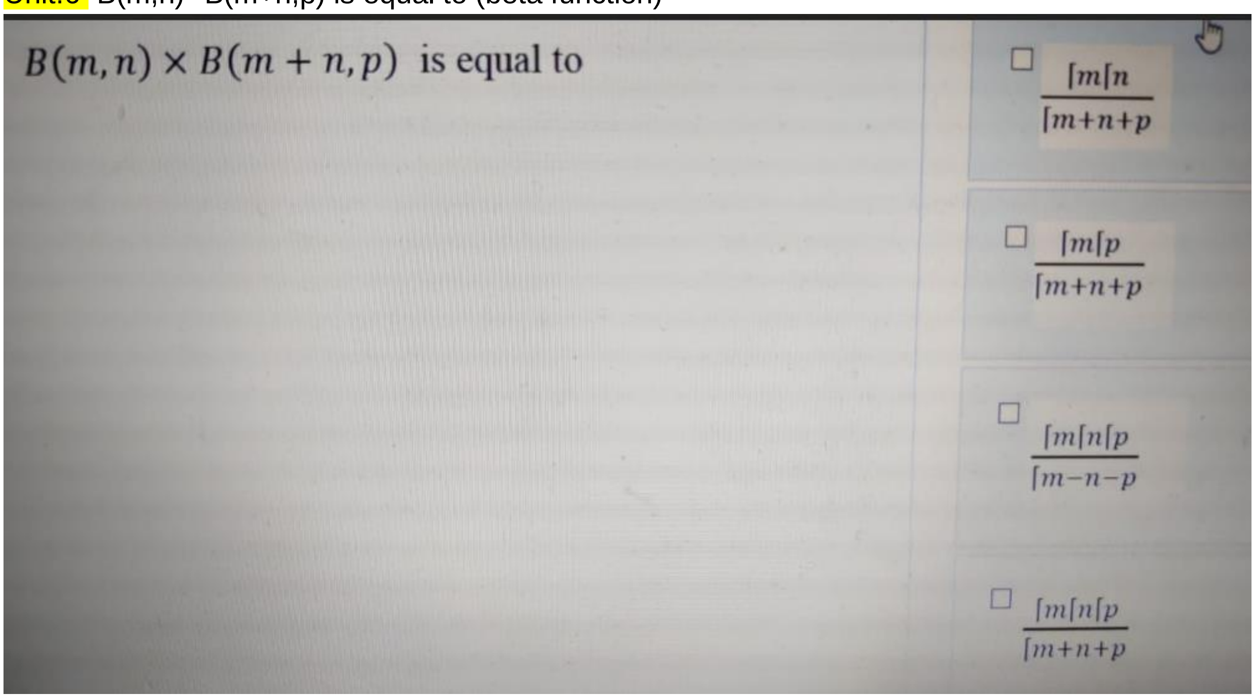


The value of the integral $\int_0^1 x^{m-1}(1-x^2)^{n-1}\,dx$ by using substitution x=$\sqrt{t}$ is

- $B\left(\frac{m}{2},n\right)$
- $\frac{1}{2}B\left(\frac{m-1}{2},n-1\right)$
- $\frac{1}{2}B\left(\frac{m}{2},n\right)$
- $B\left(\frac{m-1}{2},n-1\right)$

Ans:C(1/2B(m/2,n))

Unit:6 B(m,n)* B(m+n,p) is equal to (beta function)

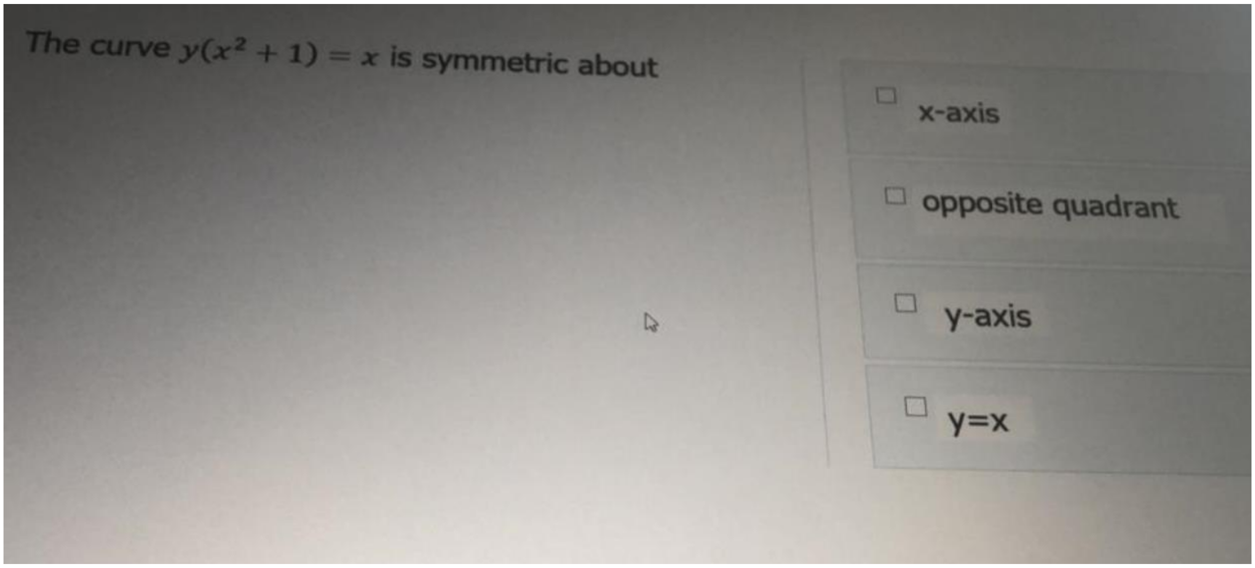


$B(m,n)\times B(m+n,p)$ is equal to

- $\frac{\Gamma m\Gamma n}{\Gamma m+n+p}$
- $\frac{\Gamma m\Gamma p}{\Gamma m+n+p}$
- $\frac{\Gamma m\Gamma n\Gamma p}{\Gamma m-n-p}$
- $\frac{\Gamma m\Gamma n\Gamma p}{\Gamma m+n+p}$

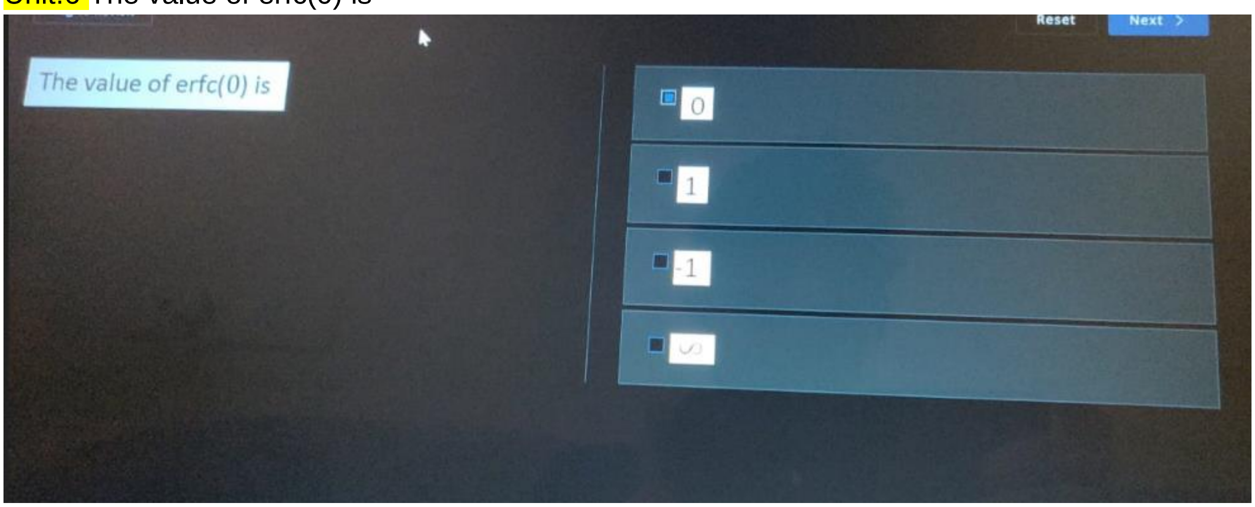
Ans: D

Unit:6 The curve y(x^2+1)=x is symmetric about



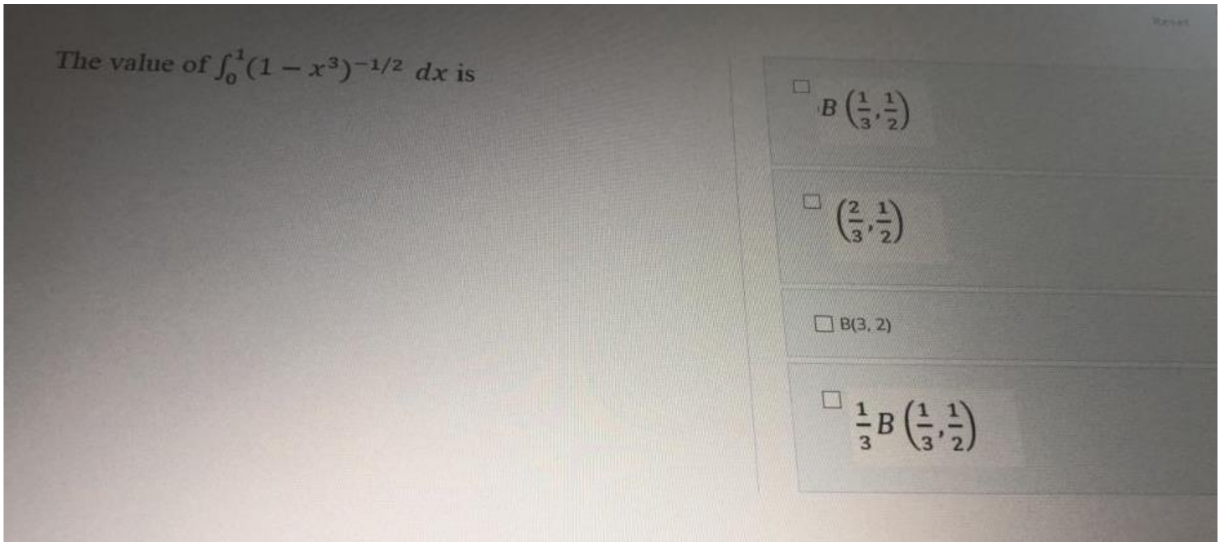
Ans: B opposite quadrant

Unit:6 The value of erfc(0) is



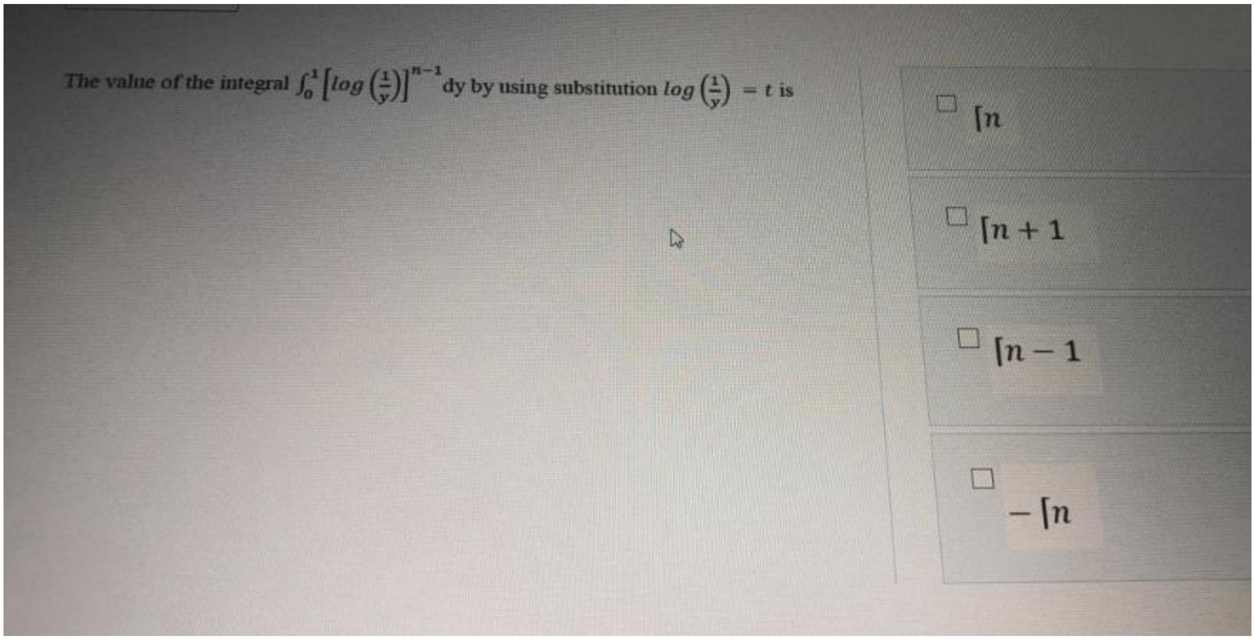
Ans: Should be 1 (B)

Unit 6: The value of (1-x^3)^-½ dx



Ans: d

Unit 6 :The value of the integral log 1/y^(n-1) dy by using substitution log(1/y)=t

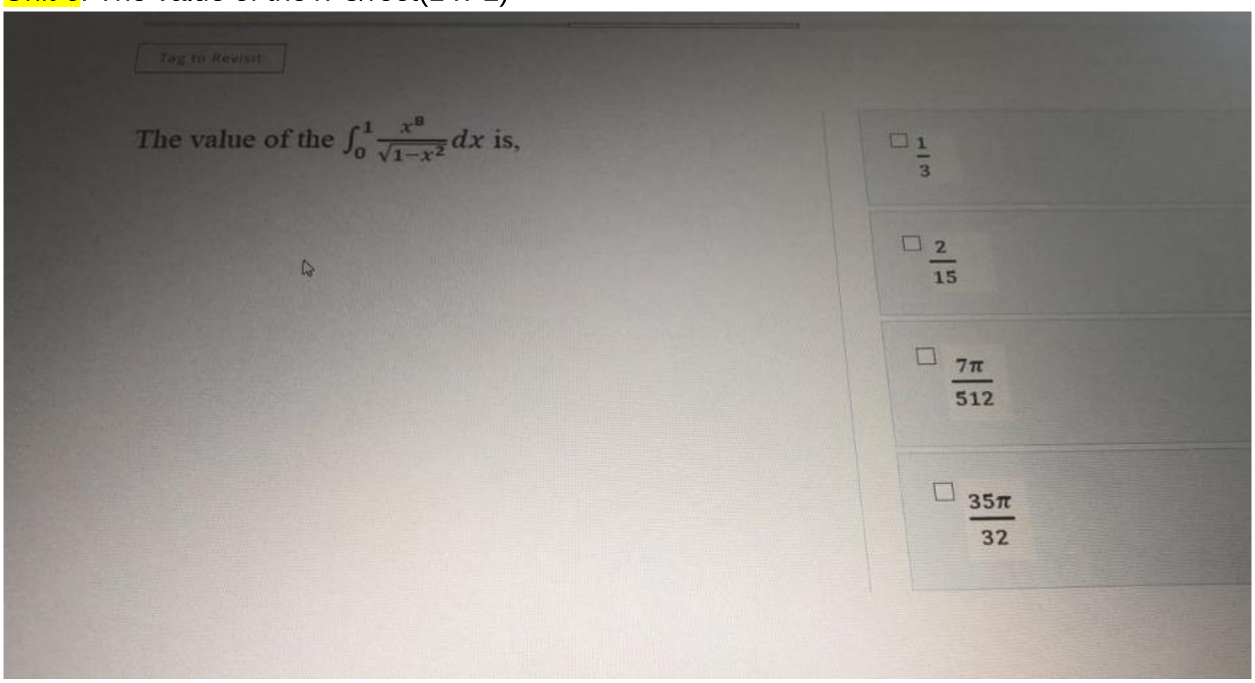


The value of the integral $\int_0^1 \left[\log\left(\frac{1}{y}\right)\right]^{n-1} dy$ by using substitution $\log\left(\frac{1}{y}\right) = t$ is

- $\lceil n$
- $\lceil n+1$
- $\lceil n-1$
- $-\lceil n$

Ans: [n-1

Unit 6: The value of the x^8/root(1-x^2)



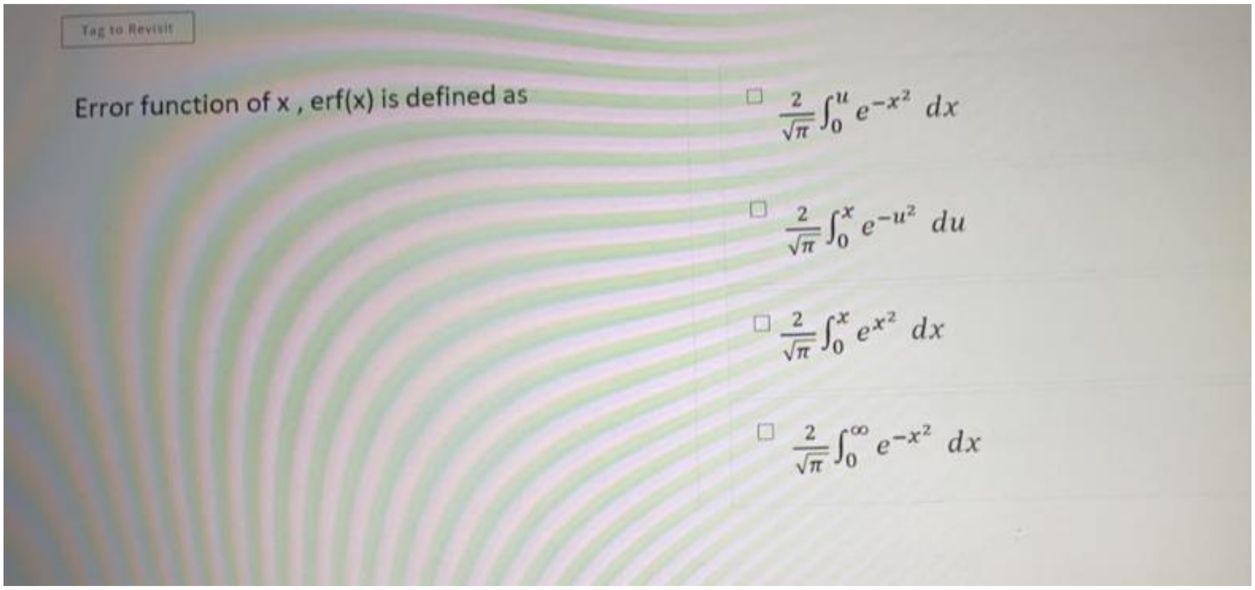
Tag to Revisit

The value of the $\int_0^1 \frac{x^8}{\sqrt{1-x^2}} dx$ is,

- $\frac{1}{3}$
- $\frac{2}{15}$
- $\frac{7\pi}{512}$
- $\frac{35\pi}{32}$

Ans: c :

Unit 6 : Error function of X, erf(x) is defined as

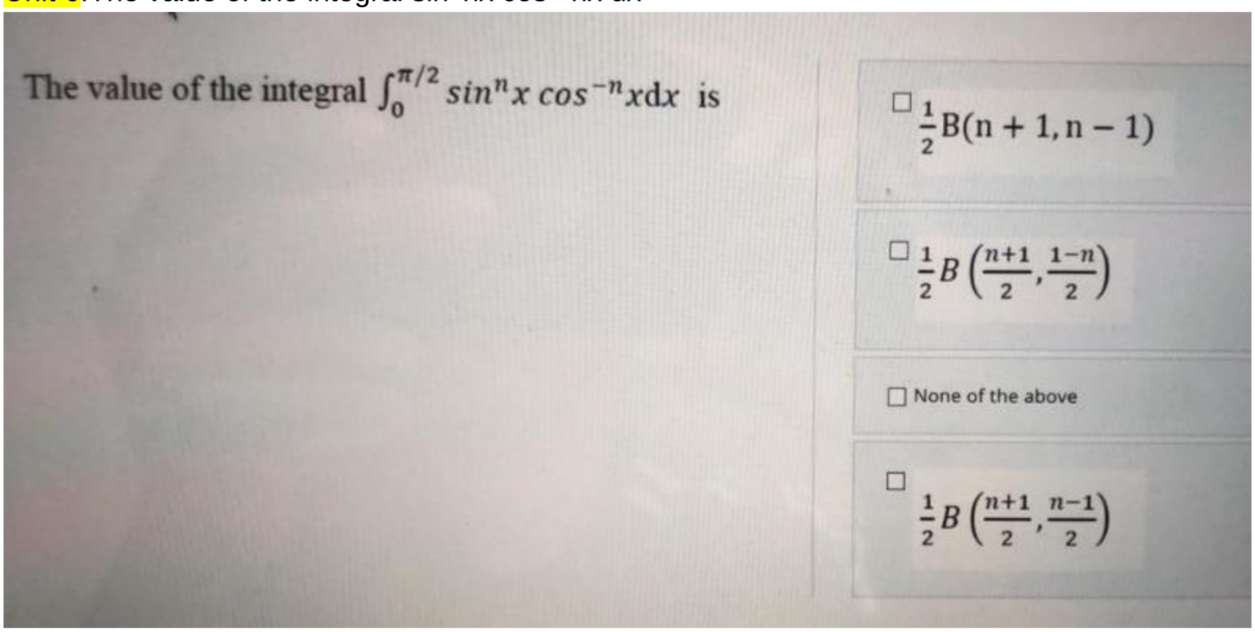

Tag to Revisit

Error function of x , erf(x) is defined as

- $\frac{2}{\sqrt{\pi}}\int_0^u e^{-x^2}\,dx$
- $\frac{2}{\sqrt{\pi}}\int_0^x e^{-u^2}\,du$
- $\frac{2}{\sqrt{\pi}}\int_0^x e^{x^2}\,dx$
- $\frac{2}{\sqrt{\pi}}\int_0^\infty e^{-x^2}\,dx$

Ans: b

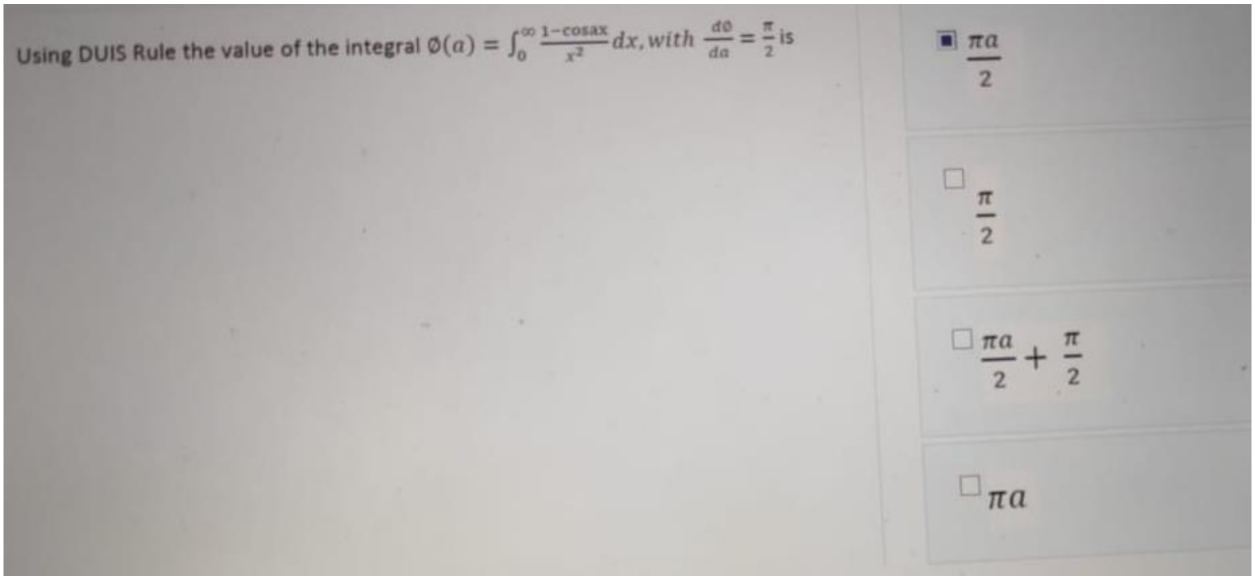
Unit 6:The value of the integral sin^nx cos^-nx dx


The value of the integral $\int_0^{\pi/2} sin^n x\, cos^{-n} x dx$ is

- $\frac{1}{2}\mathrm{B}(\mathrm{n}+1,\mathrm{n}-1)$
- $\frac{1}{2}B\left(\frac{n+1}{2},\frac{1-n}{2}\right)$
- None of the above
- $\frac{1}{2}B\left(\frac{n+1}{2},\frac{n-1}{2}\right)$

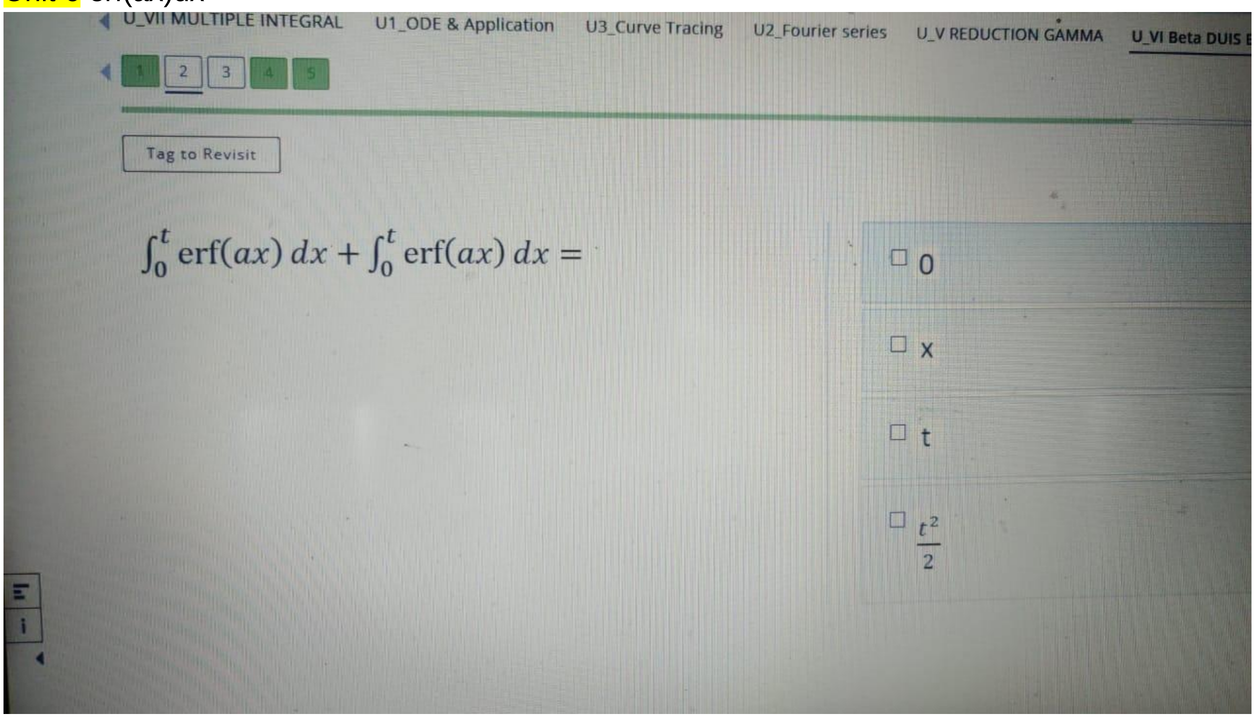
Ans: b

Unit 6 Using DUIS rule of the value of integral



Ans: Pi a/ 2

Unit 6 erf(ax)dx



Ans- option c : t

UNIT 6: Using DUIS rule the value of the integral e^-ax sin ax/x.dx from infinity to zero

Using DUIS Rule the value of the integral $\emptyset(\alpha) = \int_0^\infty \frac{e^{-\alpha x} \sin \alpha x}{x} dx$, with $\frac{d\emptyset}{d\alpha} = -\frac{1}{\alpha^2+1}$ and assuming $\int_0^\infty \frac{\sin x}{x} dx = \frac{\pi}{2}$ is

- ☐ $\log(\alpha^2 + 1) + \frac{\pi}{2}$
- ☐ $-\tan^{-1}\alpha + \frac{\pi}{2}$
- ☐ $-\tan^{-1}\alpha$
- ☐ $\tan^{-1}\alpha + \frac{\pi}{2}$

Ans: D

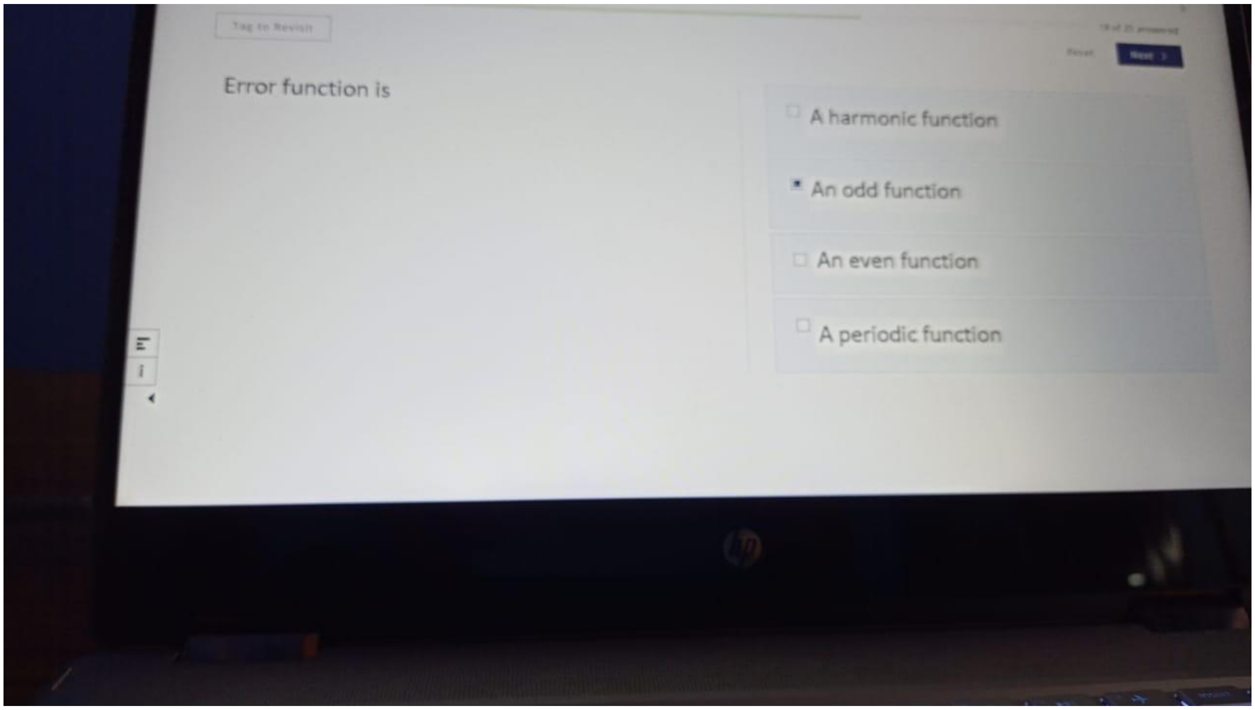
Unit:6 The value of dx/3^4x2 is

The value of $\int_0^\infty \frac{dx}{3^{4x^2}}$ is

- ☐ $\frac{\sqrt{\pi}}{3\sqrt{\log 4}}$
- ☐ $\frac{\sqrt{\pi}}{4\sqrt{\log 3}}$
- ☐ $\frac{\sqrt{\pi}}{\sqrt{\log 3}}$
- ☐ None of the above

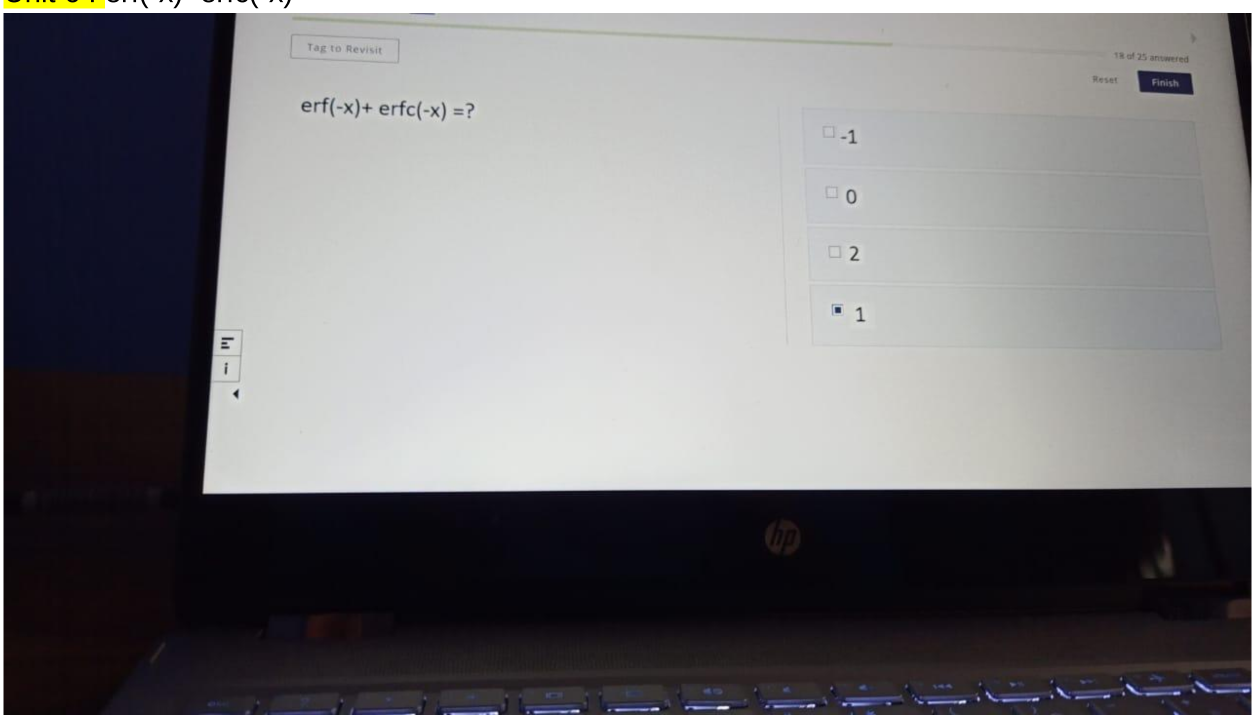
Ans: B

Unit 6 : Error Function is



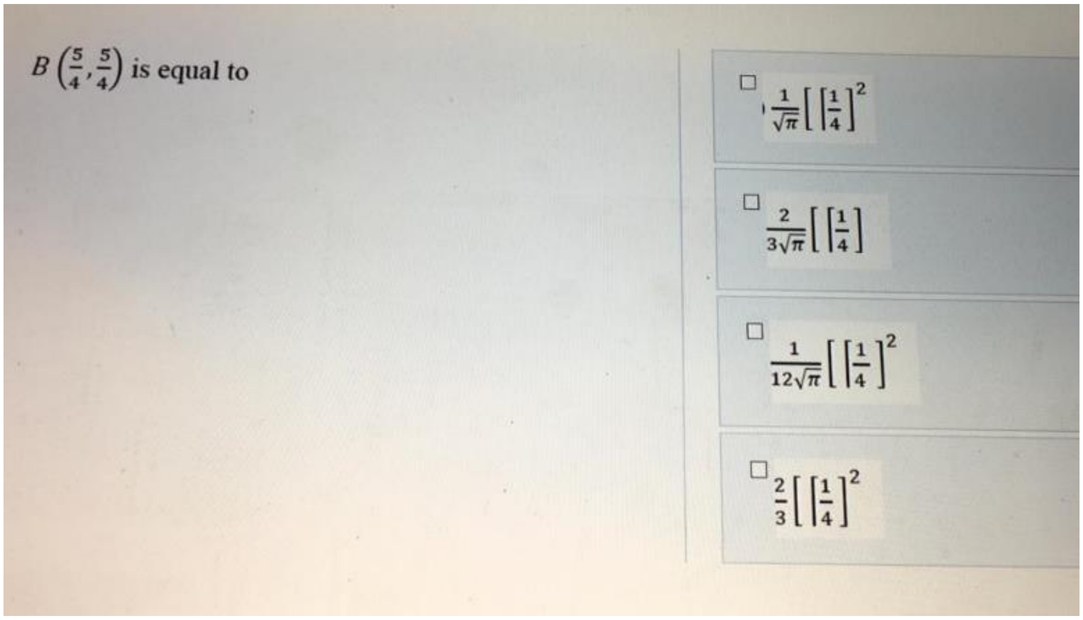
Ans. Option B : An odd function

Unit 6 : erf(-x)+erfc(-x)=



.Ans. option D : 1

Unit 6: B (5/4,5/4) is equal to

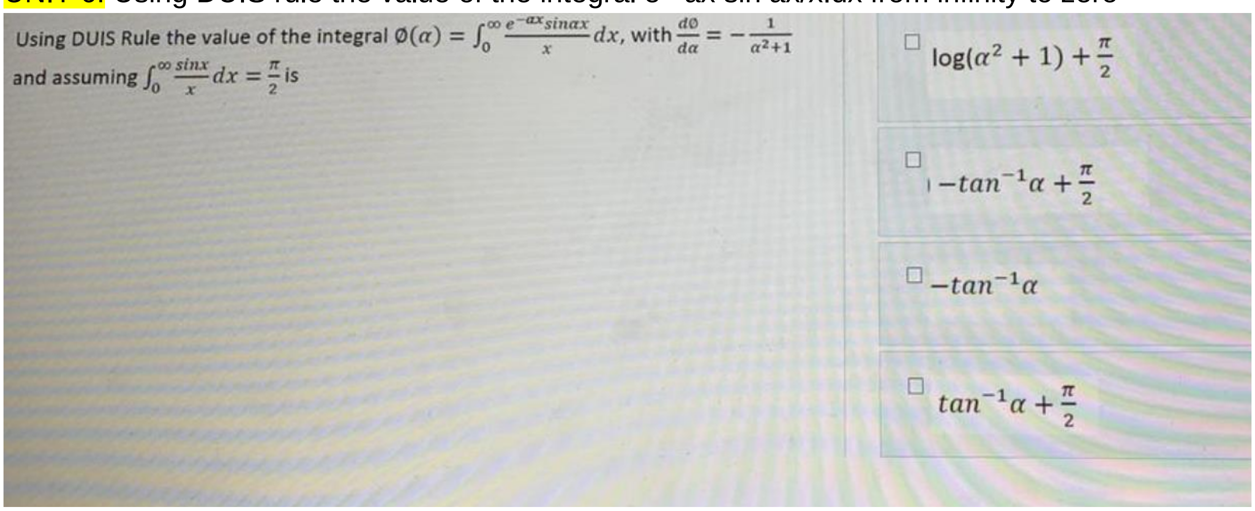


$B\left(\frac{5}{4},\frac{5}{4}\right)$ is equal to

- $\frac{1}{\sqrt{\pi}}\left[\left[\frac{1}{4}\right]\right]^2$
- $\frac{2}{3\sqrt{\pi}}\left[\left[\frac{1}{4}\right]\right]$
- $\frac{1}{12\sqrt{\pi}}\left[\left[\frac{1}{4}\right]\right]^2$
- $\frac{2}{3}\left[\left[\frac{1}{4}\right]\right]^2$

Ans: C

UNIT 6: Using DUIS rule the value of the integral e^-ax sin ax/x.dx from infinity to zero



Using DUIS Rule the value of the integral $\emptyset(\alpha) = \int_0^\infty \frac{e^{-\alpha x}\sin\alpha x}{x}dx$, with $\frac{d\emptyset}{d\alpha} = -\frac{1}{\alpha^2+1}$ and assuming $\int_0^\infty \frac{\sin x}{x}dx = \frac{\pi}{2}$ is

- $\log(\alpha^2+1)+\frac{\pi}{2}$
- $-\tan^{-1}\alpha+\frac{\pi}{2}$
- $-\tan^{-1}\alpha$
- $\tan^{-1}\alpha+\frac{\pi}{2}$

Ans: D

Unit:6 The value of dx/3^4x2 is

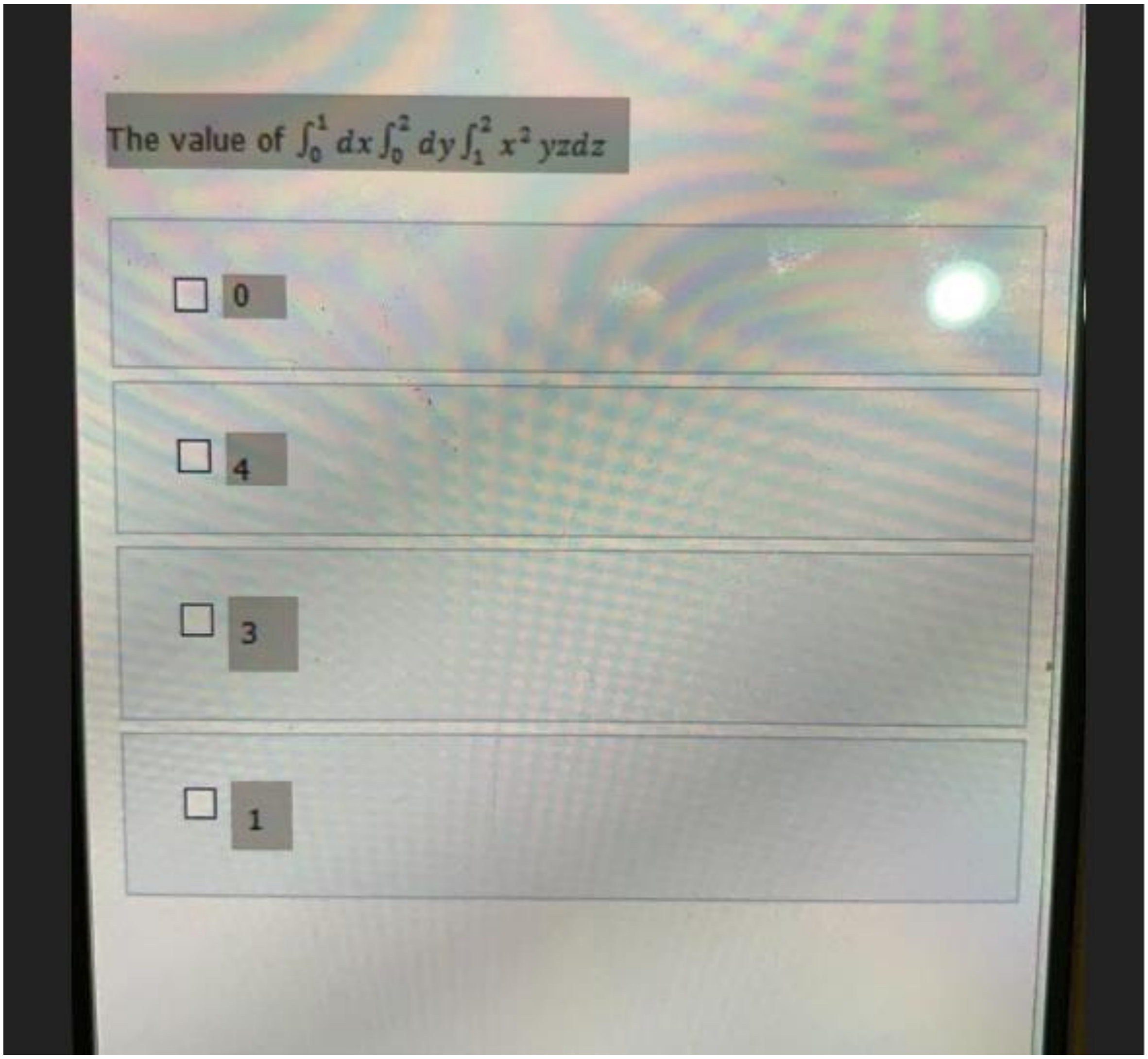
The value of $\int_0^\infty \frac{dx}{3^{4x^2}}$ is

- ☐ $\frac{\sqrt{\pi}}{3\sqrt{\log 4}}$
- ☐ $\frac{\sqrt{\pi}}{4\sqrt{\log 3}}$
- ☐ $\frac{\sqrt{\pi}}{\sqrt{\log 3}}$
- ☐ None of the above

Ans: B

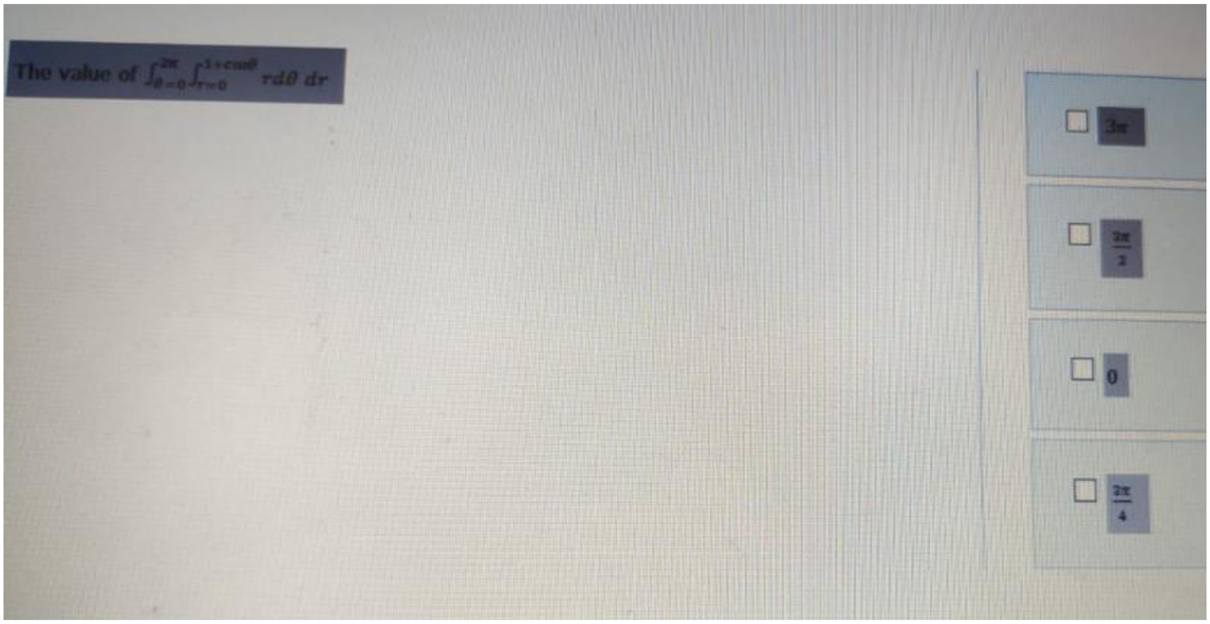
Unit: 7 (21 questions)

Unit:7 The Value of integral x^2 yz dz



Ans: d (1)

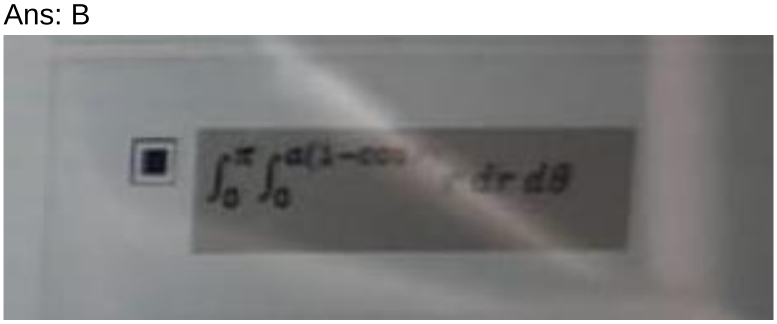
Unit 7: The value of integral r d theta dr



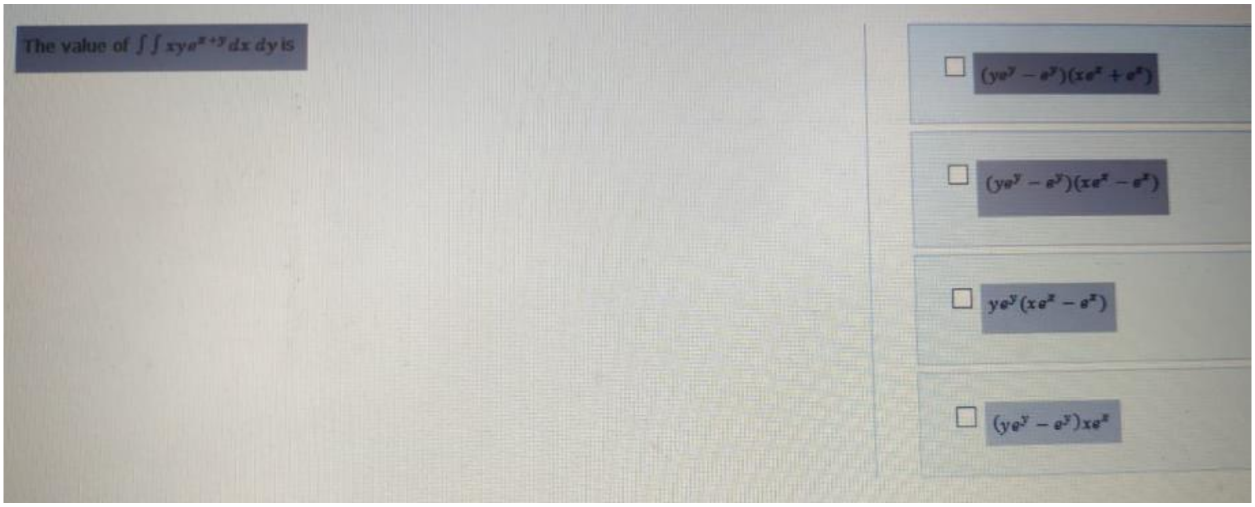
Ans: 3pi/2

Unit 7: The area of upper half of cardiode r=a(1-cos theta) is given by following double integral

Ans: B

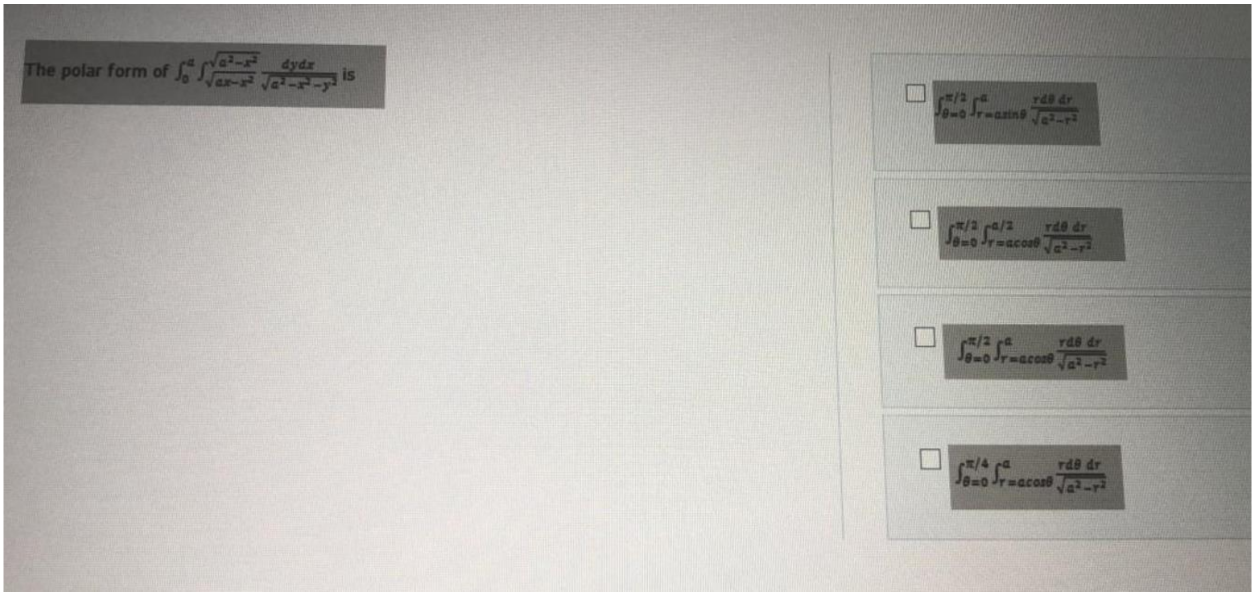


Unit 7: The value of integral xya^x+y dx dy



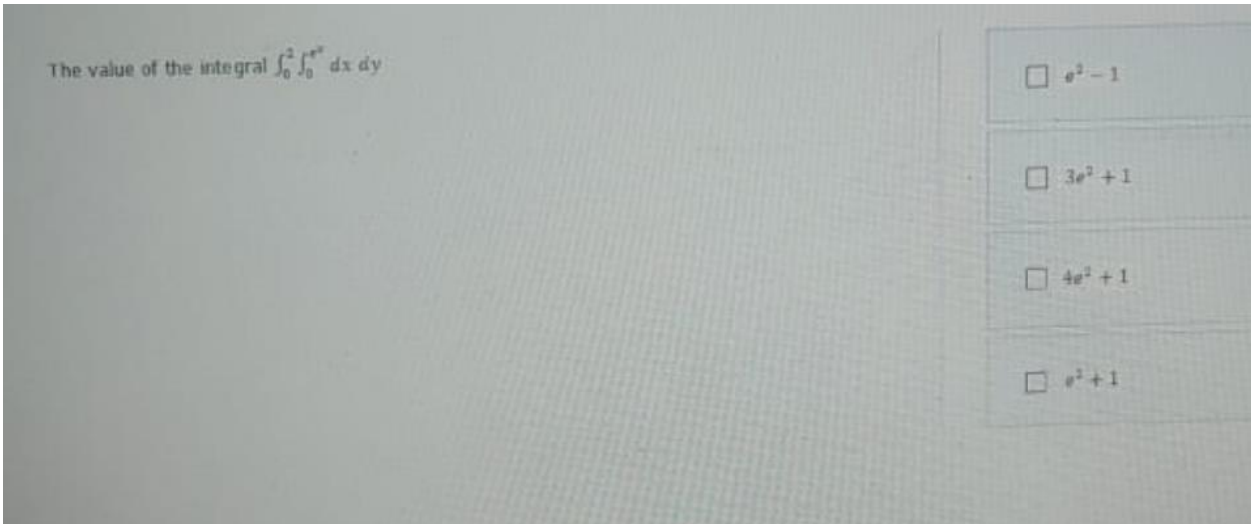
Ans:B

Unit 7 : The polar form of integral from 0 to a [root a^2-x^2/root ax-x^2] is



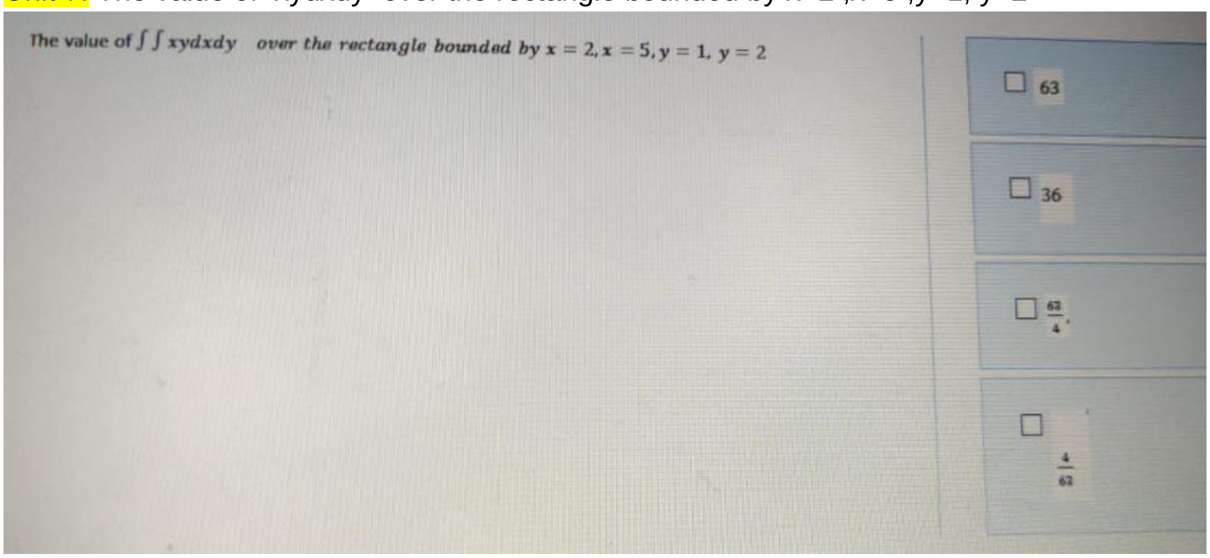
Ans: D

Unit 7: The Value of the integral : dx dy



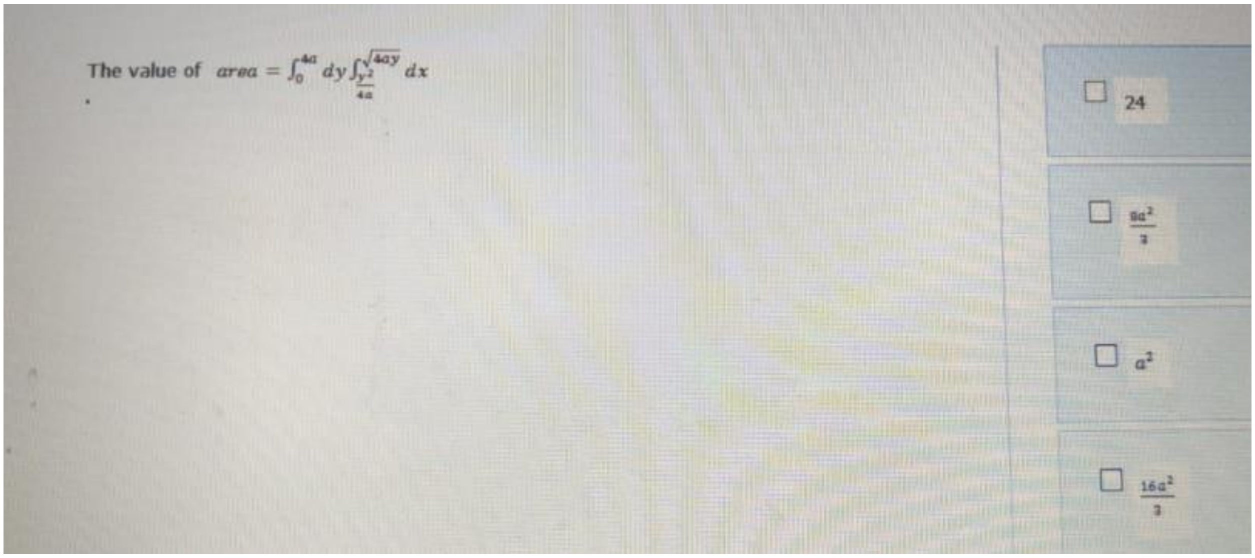
Ans:e^2-1

Unit 7: The value of xydxdy over the rectangle bounded by x=2 ,x=5 ,y=1, y=2



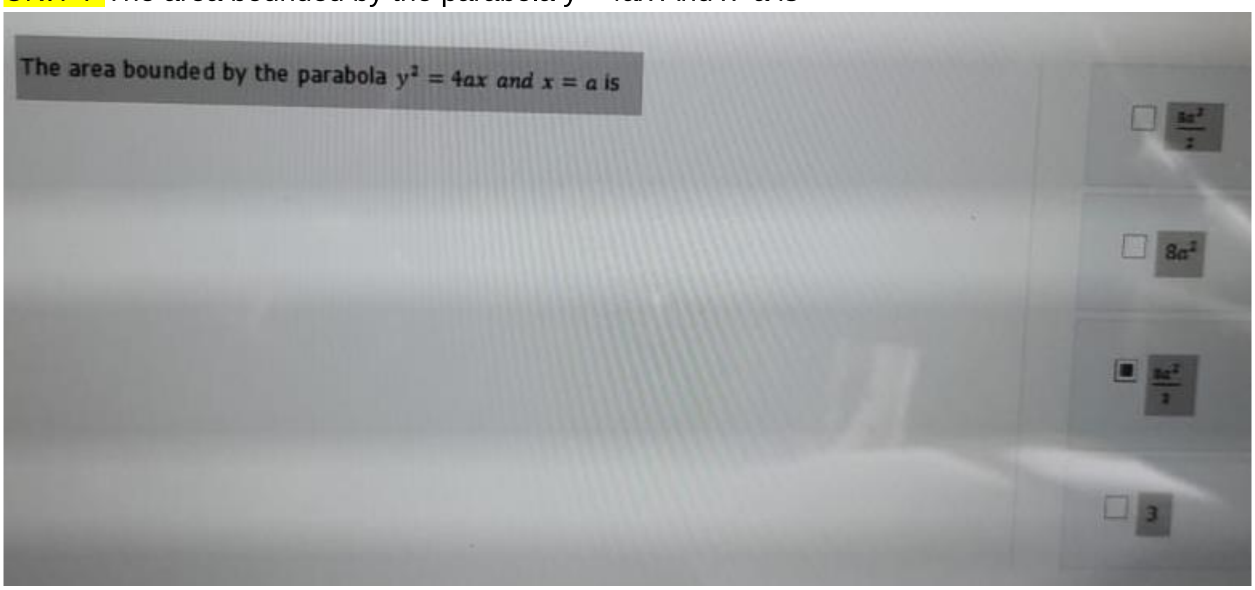
Ans: 63/4

Unit:7 The value of area 4a to 0



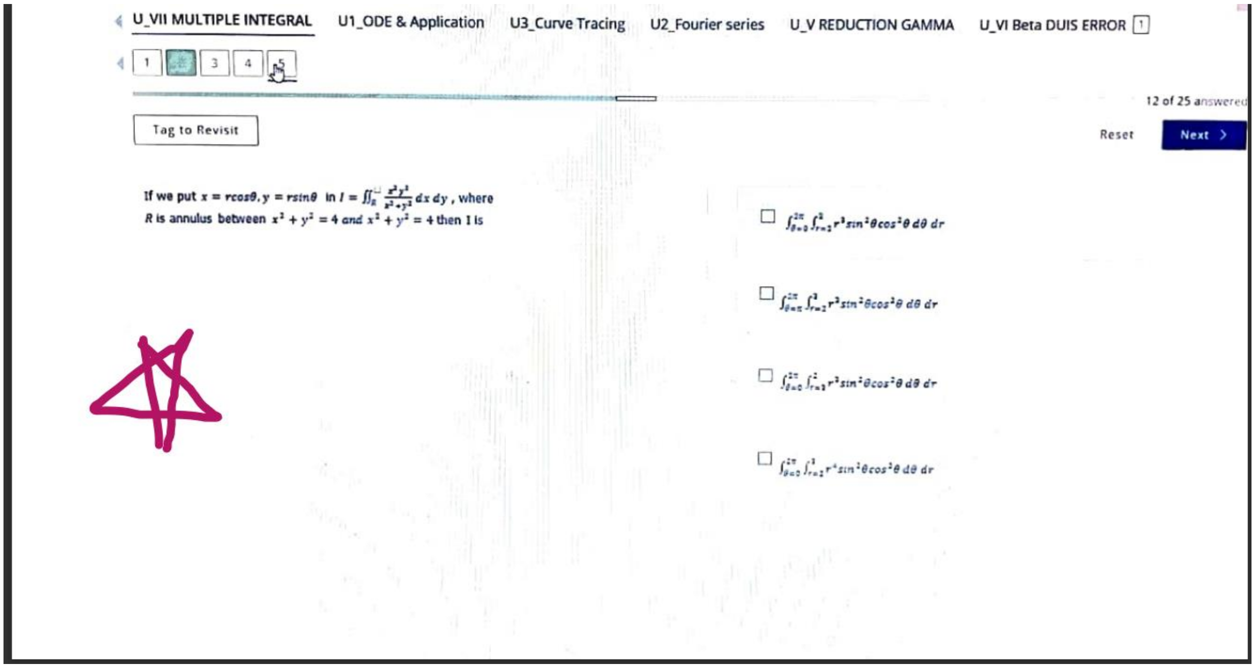
Ans: D

UNIT 7 The area bounded by the parabola y^2=4ax And x=a is



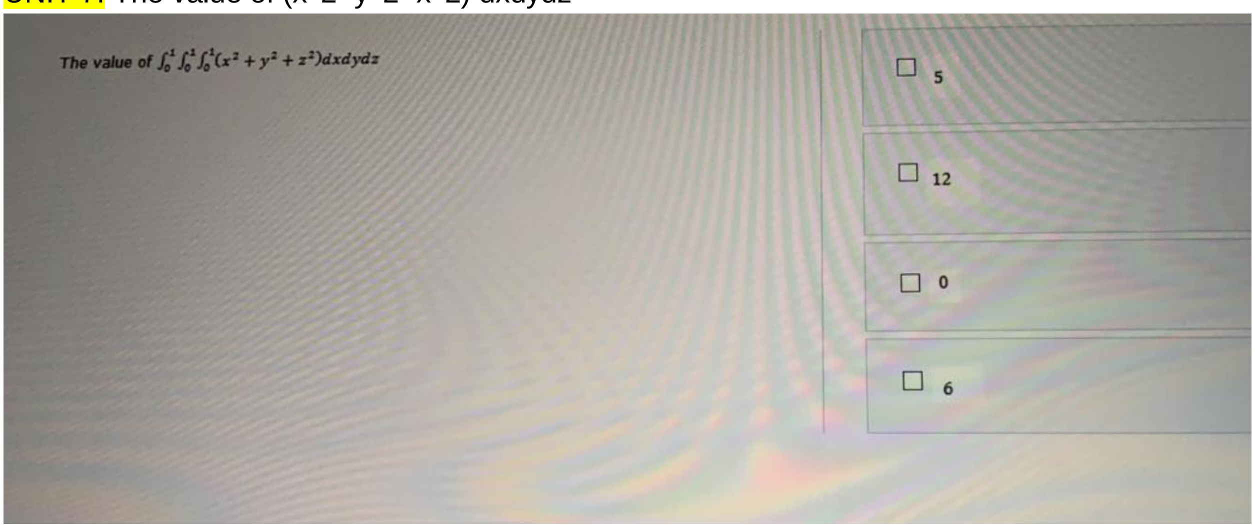
Ans:C(8a^2 / 3)

Unit:7 If we put x= r cos theta, where r is annulus between



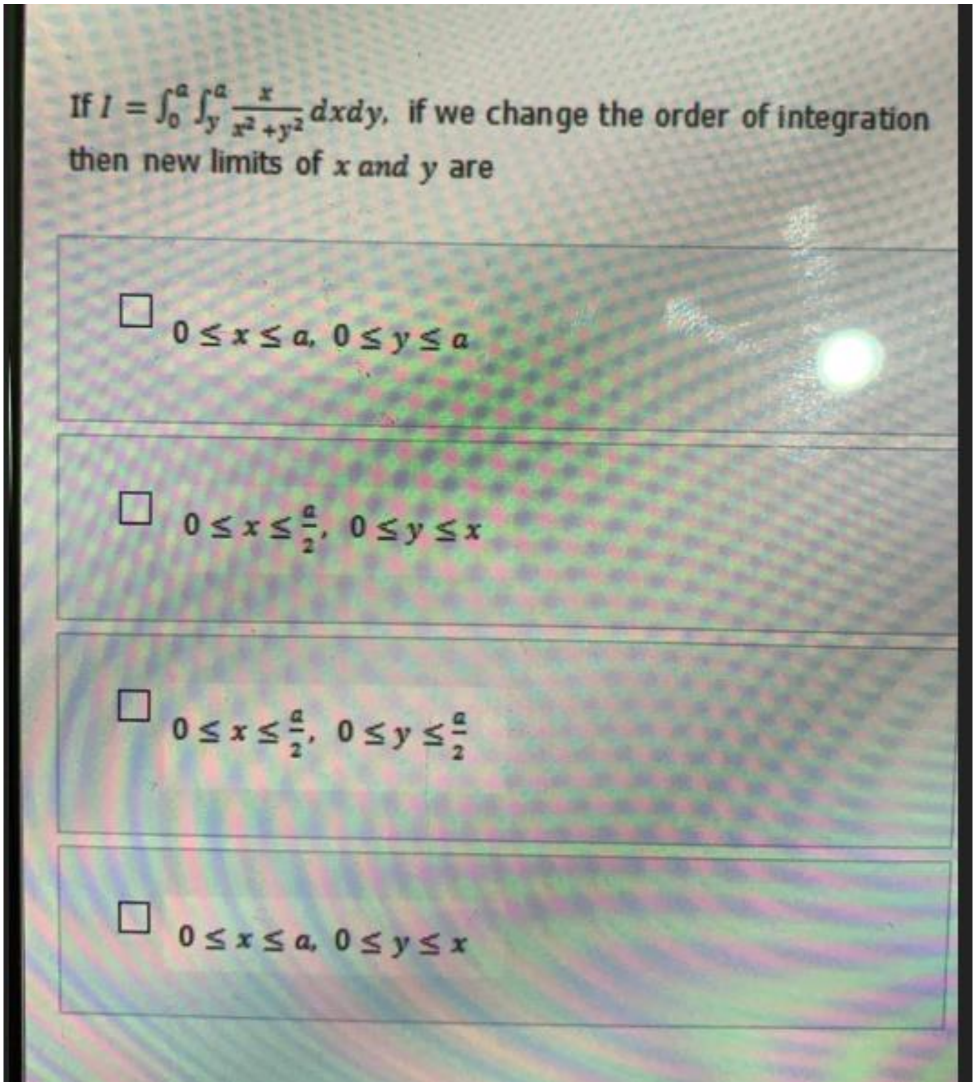
Ans: question galat he but answer A hi hoga

UNIT 7: The value of (x^2+y^2+x^2) dxdydz



Ans: 12

UNIT 7:IF we change the order of integration then the new limits of x and y are

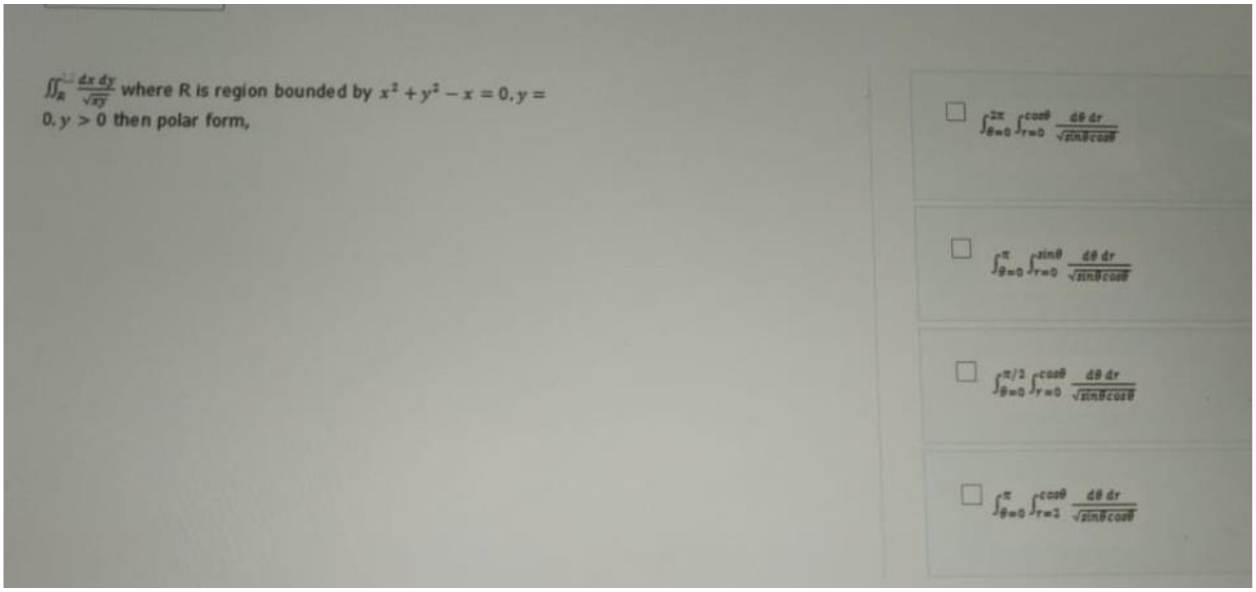


If $I = \int_0^a \int_y^a \frac{x}{x^2+y^2}\, dxdy$, if we change the order of integration then new limits of x and y are

- ☐ $0 \le x \le a,\ 0 \le y \le a$
- ☐ $0 \le x \le \frac{a}{2},\ 0 \le y \le x$
- ☐ $0 \le x \le \frac{a}{2},\ 0 \le y \le \frac{a}{2}$
- ☐ $0 \le x \le a,\ 0 \le y \le x$

Ans: D

UNIT 7 Where r is region bounded by X^2+Y^2-X=0, y=0,y>0 then polar form,



$\iint_R \frac{dx\,dy}{\sqrt{xy}}$ where R is region bounded by $x^2+y^2-x=0, y=0, y>0$ then polar form,

- [ ] $\int_{\theta=0}^{2\pi}\int_{r=0}^{\cos\theta} \frac{d\theta\,dr}{\sqrt{\sin\theta\cos\theta}}$
- [ ] $\int_{\theta=0}^{\pi}\int_{r=0}^{\sin\theta} \frac{d\theta\,dr}{\sqrt{\sin\theta\cos\theta}}$
- [ ] $\int_{\theta=0}^{\pi/2}\int_{r=0}^{\cos\theta} \frac{d\theta\,dr}{\sqrt{\sin\theta\cos\theta}}$
- [ ] $\int_{\theta=0}^{\pi}\int_{r=1}^{\cos\theta} \frac{d\theta\,dr}{\sqrt{\sin\theta\cos\theta}}$

Ans: c (best guess)[still not very sure]

Sauce

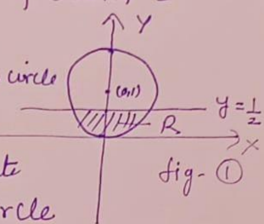
Soln

$x^2+y^2-2y=0$

$x^2+1+y^2-2y=1$

$x^2+(y-1)^2=1$ Circle with center (0,1) & radius 1

Note that Area of given Region (R) = $\frac{1}{4}$ Area of given circle



So, we have to calculate only Area of given circle

$$A=\iint dx\,dy=\iint r\,dr\,d\theta$$

Now $x=r\cos\theta$ $y=r\sin\theta$

$r^2-2r\sin\theta=0$

$r(r-2\sin\theta)=0$

$\Rightarrow r=0$ & $r=2\sin\theta$

$\therefore$ θ moves 0 to π ($\because$ fig-①)

Now $\iint r\,dr\,d\theta=\int_0^{\pi}\int_{r=0}^{2\sin\theta} r\,dr\,d\theta$

$=\frac{1}{2}\int_0^{\pi}\left[r^2\right]_0^{2\sin\theta}$

$=2\int_0^{\pi}\sin^2\theta=2\times2\times\frac{\pi}{4}$

$=\pi$

Thus $\boxed{Area(R)=\frac{1}{4}\pi}$

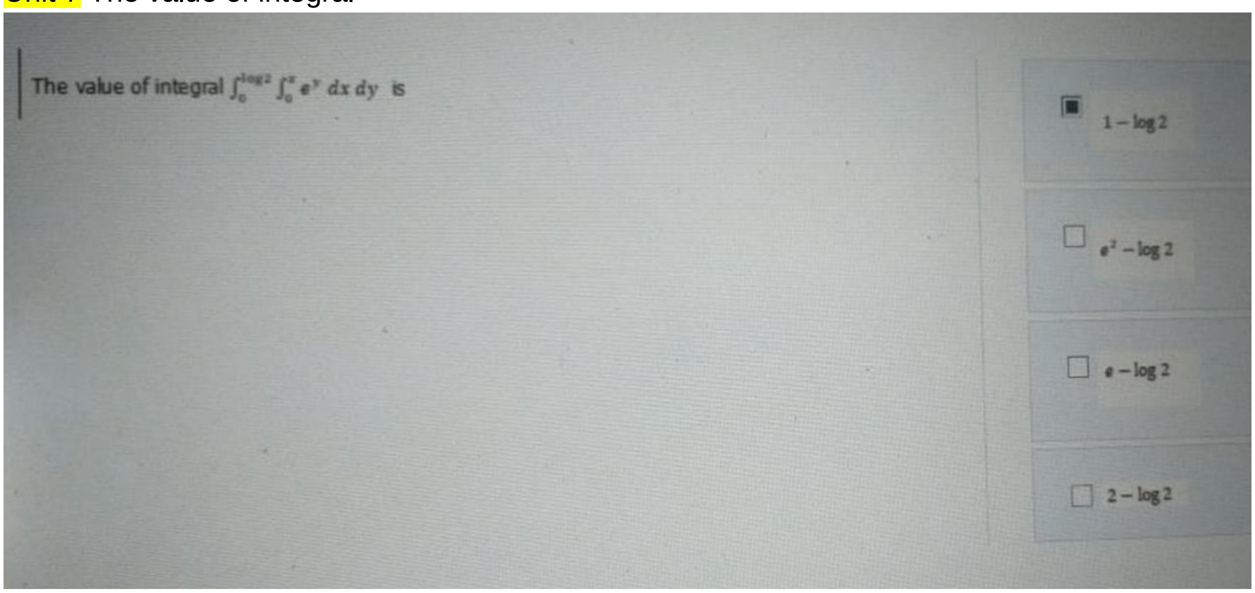
Unit 7 The value of xsinydx dy

Ans: $\pi^2/2 + 2$

Unit7 The value of the integral dzdydx is

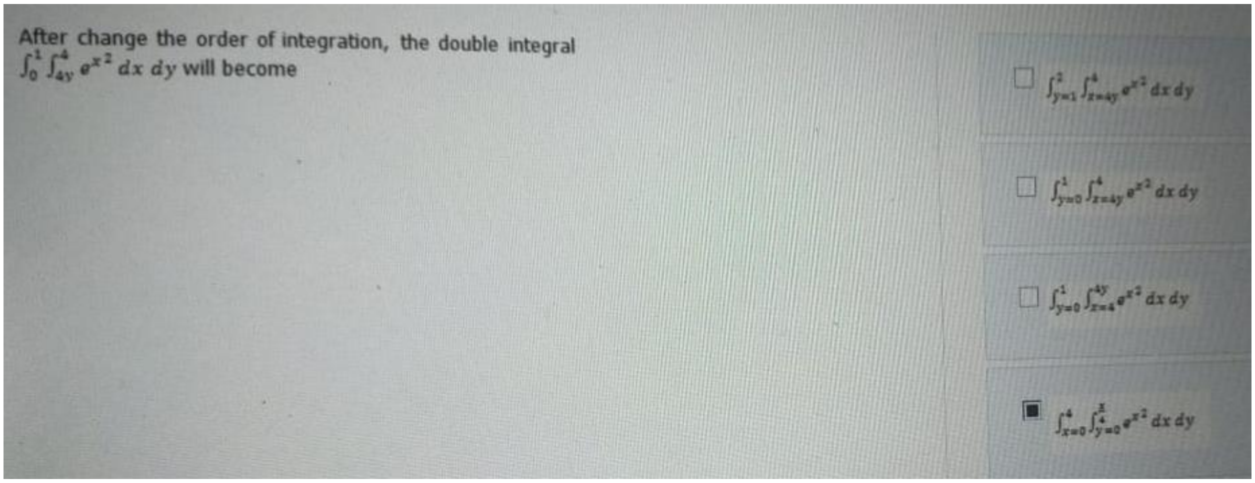
Ans: ⅛

Unit 7 The value of integral



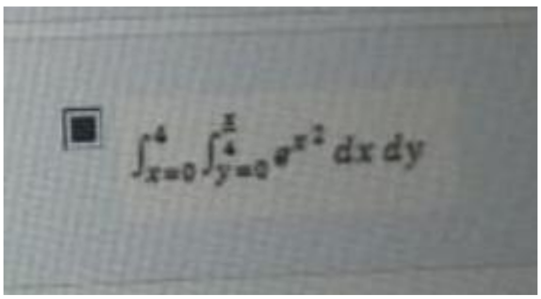
Ans: 1-log2

Unit 7 After change the order of integration, the double integral dx dy will become

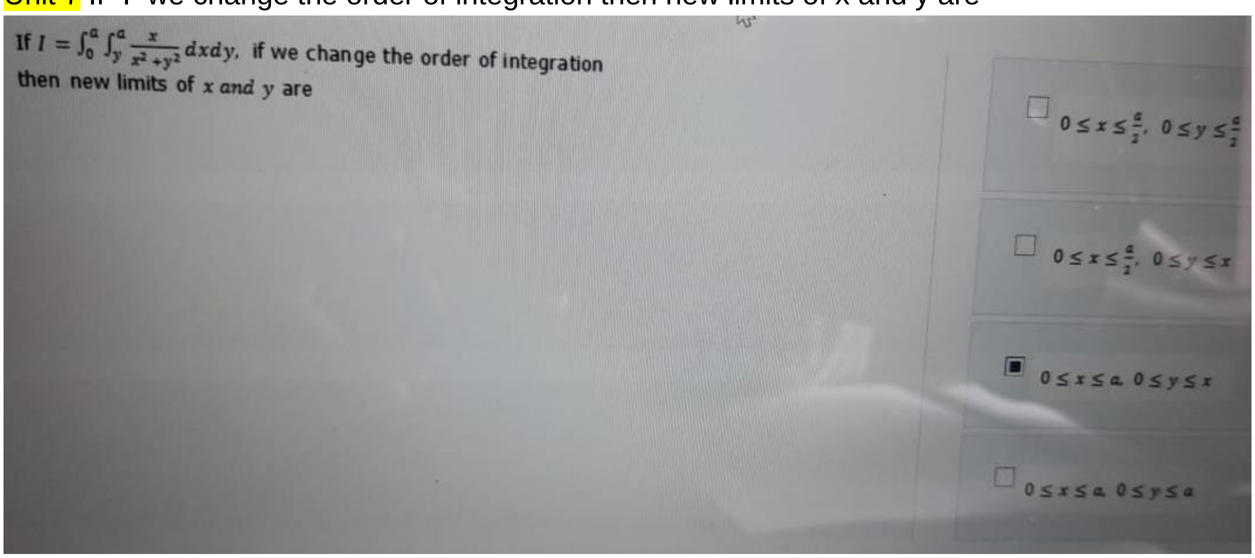

After change the order of integration, the double integral $\int_0^1\int_{4y}^4 e^{x^2}\,dx\,dy$ will become

- ☐ $\int_{y=1}^{2}\int_{x=4y}^{4} e^{x^2}\,dx\,dy$
- ☐ $\int_{y=0}^{1}\int_{x=4y}^{4} e^{x^2}\,dx\,dy$
- ☐ $\int_{y=0}^{1}\int_{x=4}^{4y} e^{x^2}\,dx\,dy$
- ■ $\int_{x=0}^{4}\int_{y=0}^{\frac{x}{4}} e^{x^2}\,dx\,dy$

Ans: d


■ $\int_{x=0}^{4}\int_{y=0}^{\frac{x}{4}} e^{x^2}\,dx\,dy$

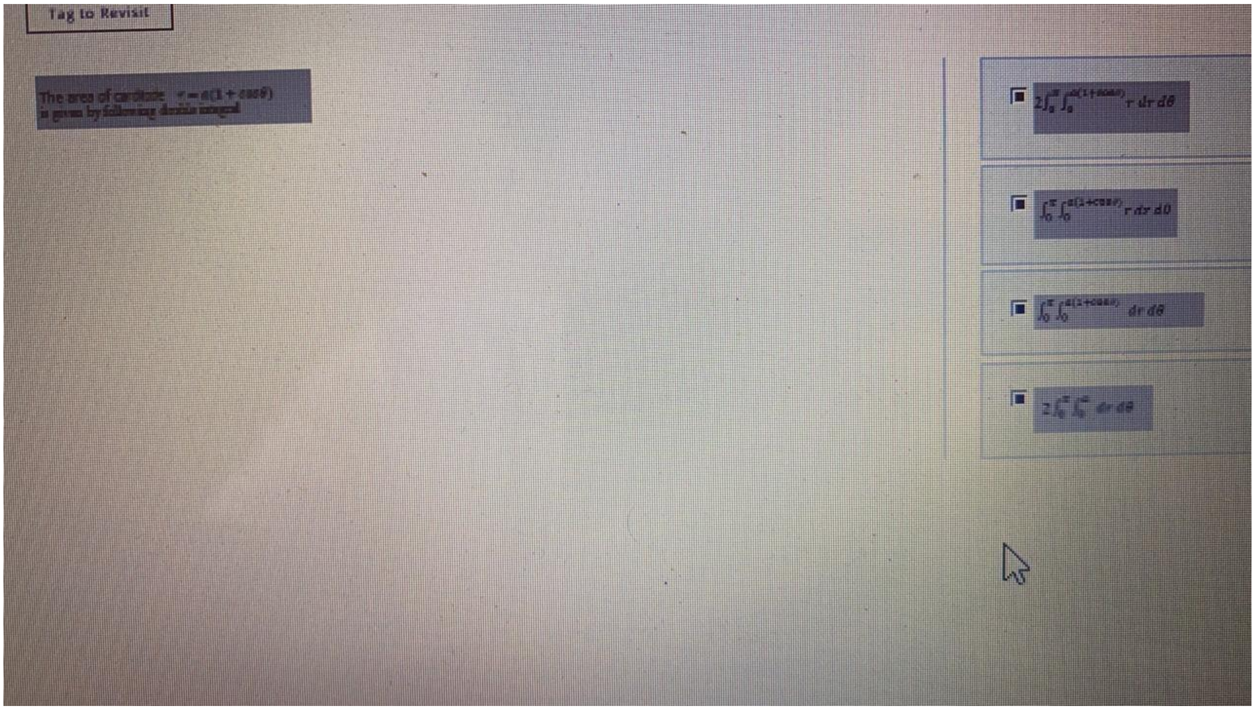
Unit 7 IF I we change the order of integration then new limits of x and y are


If $I=\int_0^a\int_y^a \frac{x}{x^2+y^2}\,dxdy$, if we change the order of integration then new limits of x and y are

- ☐ $0\le x\le \frac{a}{2},\ 0\le y\le \frac{a}{2}$
- ☐ $0\le x\le \frac{a}{2},\ 0\le y\le x$
- ■ $0\le x\le a,\ 0\le y\le x$
- ☐ $0\le x\le a,\ 0\le y\le a$

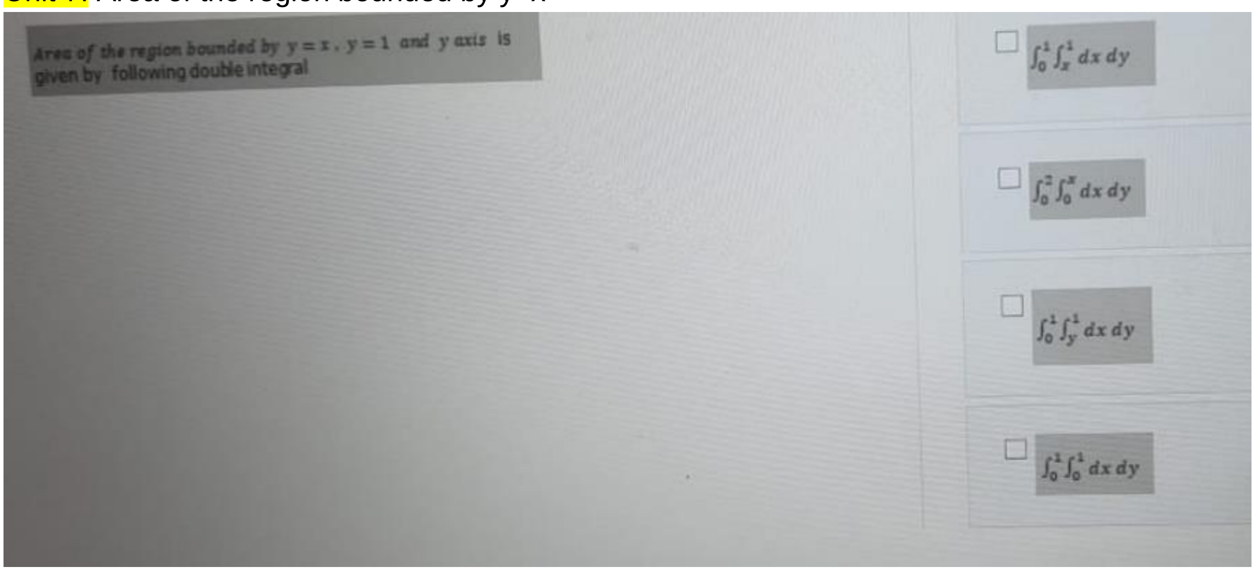
Ans: c

Unit 7 The area of cardiode



Ans A

Unit 7: Area of the region bounded by y=x



Ans: C

Unit 7: The value of sintheta dtheta dr

The value of $\int_{r=0}^{a}\int_{\theta=0}^{\pi}\int_{\phi=0}^{2\pi} r^2 \sin\theta \, d\theta \, d\phi \, dr$

- ☐ $8a^3 \frac{\pi}{3}$
- ☐ $2a^3 \frac{\pi}{3}$
- ☐ $4a^3 \frac{\pi}{3}$
- ☐ $a^3 \frac{\pi}{3}$

Ans B