INTEGRAL

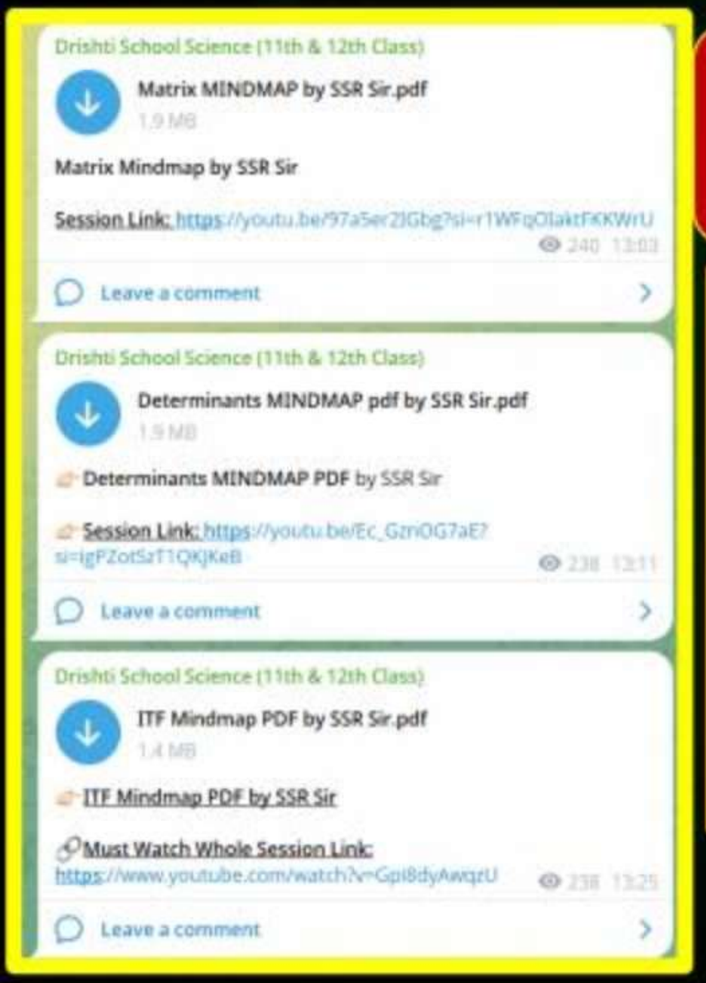
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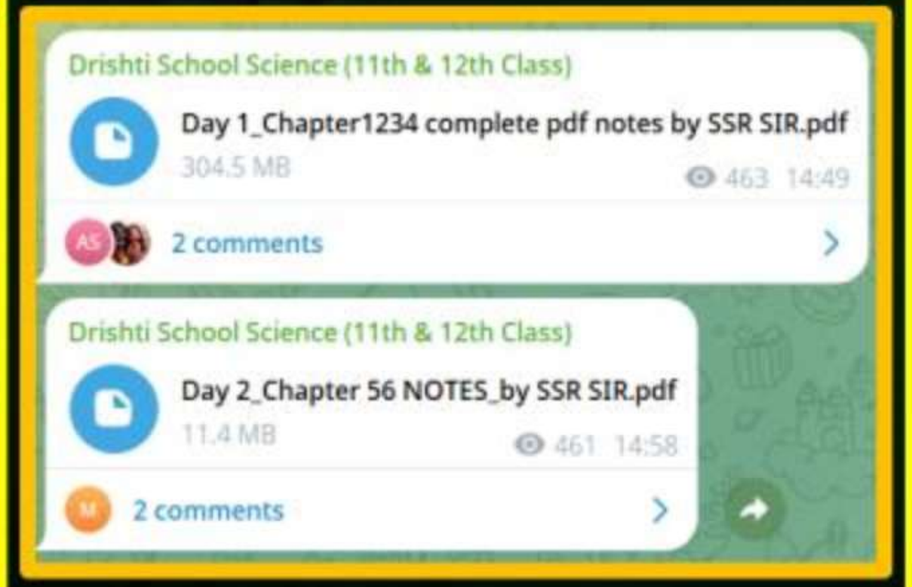


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Topics to be covered

1. Basic Integral
2. Substitutions: Trigo
3. Substitutions: Exponential
4. Substitutions: Concept of Fractional Power/Large power
1. 6 Special Integrals
2. 3 Special Integrals
3. Adjustment method
4. Partial Fraction Method
2. By Parts method
3. Definite integral basics
4. DE by Indefinite rule, modulus integrals, DE in by part rule
4. 3 Important properties of DE

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ABOUT CND Integral

- Weightage in CUET: 15 -20 marks

- What resources you should follow:
- BPPT 5.0 only 6.0
- This PPT Content

- Importance of Chapter:
  - Integrals: 7,8,9 Barbaad

(1) Dimag.

(2) Fixed Method

(3) Pattern of Q.

(4) Substitution – Rattle

(5) Int Times ~ 300 Q ~ 6.0

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Basics of Integral

Indefinite Integral means finding the anti-derivative of a function.

If

$$\frac{d}{dx}F(x) = f(x)$$

Then

$$\int f(x)dx = F(x) + C$$

Here C is called Constant of Integration.

Arbitary Const

* $\frac{d}{dx}(x^2) = 2x$

$$\int 2x\,dx = x^2$$

* $\frac{d}{dx}(x^2+5) = 2x$

$$\int 2x\,dx = (x^2+5)$$

* $\frac{d}{dx}(x^2+C) = 2x$

$$\int 2x\,dx = (x^2+C)$$ ✓

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Importance of +C

Value don't fixed

Because derivative of any constant is 0 .

Example:

$$\frac{d}{dx}(x^2 + 5) = 2x$$

$$\frac{d}{dx}(x^2 - 3) = 2x$$

Const	Ac.
2, 3, 5, 7	✓
$\sqrt{2}$	C, A, B--

So,

$$\int 2x\,dx = x^2 + C$$

Without +C , answer is incomplete !

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Arbitrary Constant & Constant

$$\int 2x\,dx = (x^2 + c)$$

$y = x^2 + c$ → General Curve

→ Family of Curve

$c = 0 \Rightarrow y = x^2$

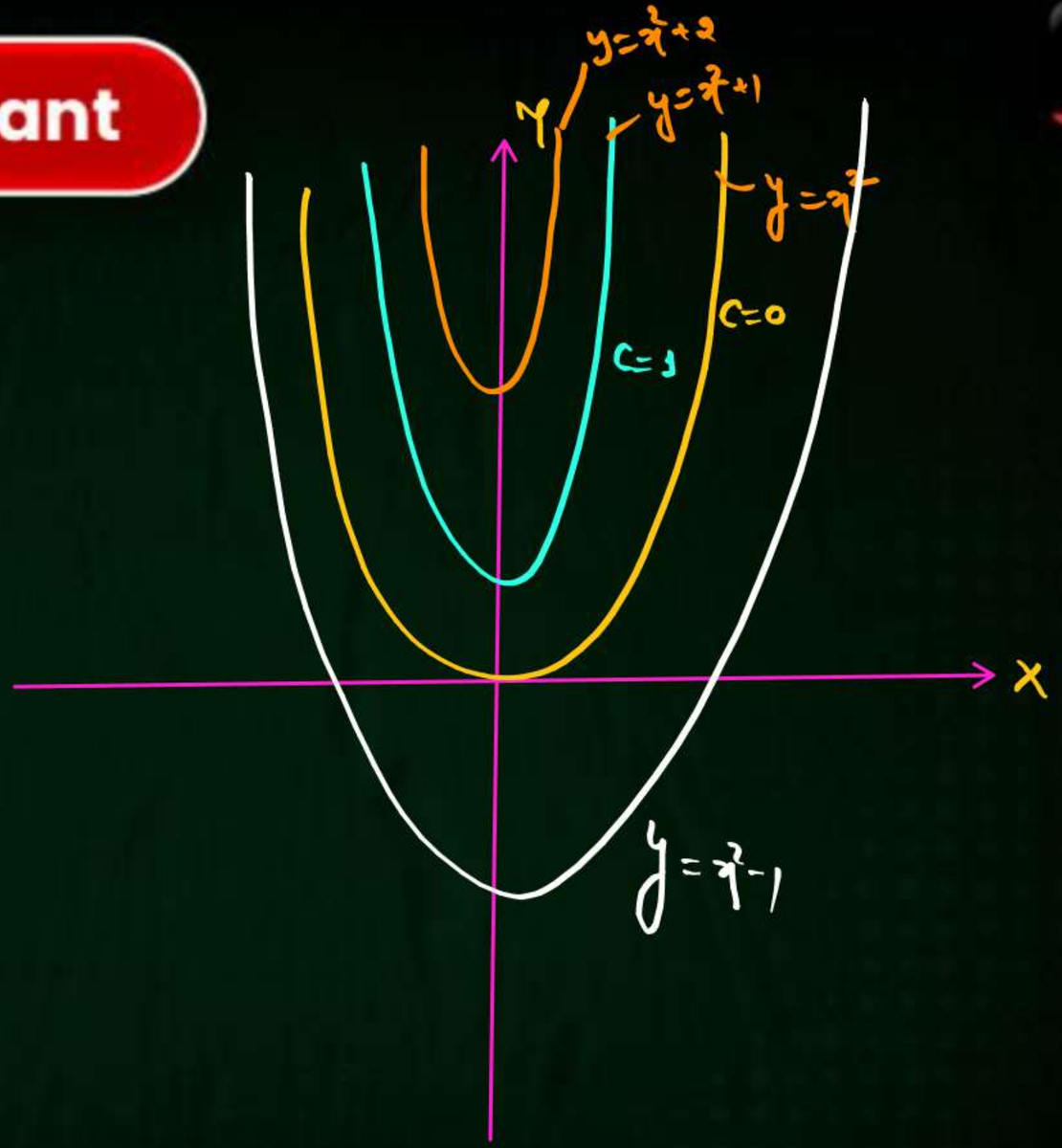
$c = 1 \Rightarrow y = x^2 + 1$

$c = 2 \Rightarrow y = x^2 + 2$

:

$c = -1 \Rightarrow y = x^2 - 1$

→ Particular Curve.



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BASIC INTEGRAL Formulas

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C \quad (n \neq -1)$$

$$\int \frac{1}{x} dx = \ln|x| + C$$

$$\int e^x dx = e^x + C$$

$$\int a^x dx = \frac{a^x}{\ln a} + C$$

$$\int k\,dx = kx + C$$

$$\int \sin x dx = -\cos x + C$$

$$\int \cos x dx = \sin x + C$$

$$\int \sec^2 x dx = \tan x + C$$

$$\int \csc^2 x dx = -\cot x + C$$

$$\int \sec x \tan x dx = \sec x + C$$

$$\int \csc x \cot x dx = -\csc x + C$$

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BASIC INTEGRAL Formulas

$$\int \frac{+1}{\sqrt{1-x^2}}\,dx = \sin^{-1}x + C$$

$$\int \frac{-1}{\sqrt{1-x^2}}\,dx = \cos^{-1}x + C$$

$$\int \frac{+1}{1+x^2}\,dx = \tan^{-1}x + C$$

$$\int \frac{-1}{1+x^2}\,dx = \cot^{-1}x + C$$

$$\int \frac{1}{x\sqrt{x^2-1}}\,dx = \sec^{-1}|x| + C$$

$$\int \frac{-1}{x\sqrt{x^2-1}}\,dx = \csc^{-1}|x| + C$$

#

$$\int \sqrt{x}\,dx = \frac{2}{3}x^{3/2} + C$$

$$\int \frac{1}{\sqrt{x}}\,dx = 2\sqrt{x} + C$$

$$\int \frac{1}{x^2}\,dx = -\frac{1}{x} + C$$

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Basic Properties of Indefinite Integrals

$$\int (f(x) \pm g(x))dx = \int f(x)dx \pm \int g(x)dx$$

$$\int kf(x)dx = k\int f(x)dx$$

$k \in R$

$\int \alpha\sqrt{\beta^\delta}\, d\beta \Rightarrow \alpha\gamma \int \beta\, d\beta$

$\Rightarrow \alpha\delta \cdot \frac{\beta^2}{2} + C$

$\# \int (\sin\alpha)dx \Rightarrow (\sin\alpha)\int 1\,dx$

$\Rightarrow (\sin\alpha)x + C$

$\int x\,dx = \frac{x^2}{2} + C$

$\int \alpha z\, dz \Rightarrow \alpha \int z\, dz \Rightarrow \alpha\left(\frac{z^2}{2}\right)$

Const

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2 Important Deductions

$\int \sin x\,dx = -\cos x + C$

(1) $\int \sin[x+5] = -\cos(x+5) + C$ (linear)

Integrals of the Form f(x + b)

$\int \sin x^2\,dx \neq \cos x^2 + C$

$$\int f(x+b)\,dx = F(x+b) + C$$

Degree of $x = 1$ (Power of $x = 1$)

Integrals of the Form f(ax + b)

$\int \sin(5x+3)\,dx \Rightarrow -\frac{\cos(5x+3)}{5} + C$

$$\int f(ax+b)\,dx = \frac{1}{a}F(ax+b) + C$$

linear

$$\int \cos(x+4)\,dx$$

$\Rightarrow \sin(x+4) + C$

$$\int \frac{1}{x+2}\,dx \Rightarrow \ln|x+2| + C$$

$\int \frac{1}{x}dx = \ln|x|$

$$\int \sin(3x+2)\,dx$$

$\int \sin x\,dx = \cos x + C$

$-\frac{\cos(3x+2)}{3} + C$ Ans

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Question: CUET 2026 PYQs

$$\int \left(\sqrt{x} - \frac{1}{\sqrt{x}}\right)^2 dx = \textbf{(where } x > 0\textbf{)}$$

$\Rightarrow I = \int \left(x + \frac{1}{x} - 2\right) dx$

$\Rightarrow \frac{x^2}{2} + \ln|x| - 2x + C$

(A) $\frac{x^2}{2} + \log_e |x| - 2x + c$: where c is an arbitrary constant

(B) $x^2 + \frac{2x^{3/2}}{3} + 2x + c$: where c is an arbitrary constant

(C) $\frac{2x^{3/2}}{3} - 2x^{1/2} + c$: where c is an arbitrary constant

(D) $\left(\sqrt{x} - \frac{1}{\sqrt{x}}\right)^{3/2} + c$: where c is an arbitrary constant

Question: CUET 2026 PYQs / 2024 PYQs.

The second order derivative of which of the following functions is 20^x ?

A. $\frac{20^x}{(\log_e 20)^2}$

B. $20^x (\log_e 20)^2$

C. $20^x (\log_e 20)$

D. $\frac{20^x}{\log_e 20}$

$\int 20^x \, dx$

$\Rightarrow \frac{20^x}{\log 20} + C$

$\int \frac{20^x}{(\log 20)} \, dx$

$\Rightarrow \frac{20^x}{(\log 20)(\log 20)}$

$\Rightarrow \frac{20^x}{(\log 20)^2}$

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Question: CUET 2026 PYQs

$\int \frac{2^{x+1} - 5^{x-1}}{10^x} dx$ **is equal to (where C is an arbitrary constant)**

A. $-\frac{2}{5^x \log_e 5} + \frac{1}{5(2^x \log_e 2)} + C$

B. $-\frac{2 \log_e 5}{5^x} + \frac{\log_e 2}{5(2^x)} + C$

C. $\frac{2}{5^x \log_e 5} - \frac{1}{5(2^x \log_e 2)} + C$

D. $2(5^{-x-1}) - \frac{1}{5}(2^{-x-1}) + C$

$\Rightarrow \int \frac{2^x \cdot 2 - 5^x \cdot 5^{-1}}{10^x} dx$

$\Rightarrow \int 2 \cdot \left(\frac{2}{10}\right)^x - \frac{1}{5}\left(\frac{5}{10}\right)^x dx$

$\Rightarrow \int \left[2 \cdot \left(\frac{1}{5}\right)^x - \frac{1}{5}\left(\frac{1}{2}\right)^x\right] dx$

$\Rightarrow \frac{2 \cdot (1/5)^x}{\log(1/5)} - \frac{1}{5} \cdot \frac{(\frac{1}{2})^x}{\log(1/2)} + C$

$\frac{2(1/5)^x}{-\log 5} + \frac{1}{5}\frac{(1/2)^x}{\log 2} + C$

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Question: CUET 2026 PYQs (2026)

$$\int \frac{e^{7\log x} - e^{6\log x}}{e^{5\log x} - e^{4\log x}}\,dx,\ x > 0 \text{ is equal to :}$$

$e^{\log_e x} = x$

$$\int \frac{e^{\log x^7} - e^{\log x^6}}{e^{\log x^5} - e^{\log x^4}}\,dx \Rightarrow \int \frac{x^7 - x^6}{x^5 - x^4}\,dx \Rightarrow \int \frac{x^6(x-1)}{x^4(x-1)}\,dx$$

$$\Rightarrow \int x^2\,dx$$

$$\Rightarrow \frac{x^3}{3} + C$$

Ans

A. 0

B. $x^2 + C$: where C is an arbitary constant

C. $\frac{x^3}{3} + C$: where C is an arbitary constant

D. $\frac{x^5}{5} + C$: where C is an arbitary constant

Question: CUET 2026 PYQs

$\int e^{x \log_e a} \cdot e^x \, dx$ **is: [where C is an arbitrary constant]**

- **A** $\dfrac{e^x}{1+\log_e(ae)} + C$
- **B** $\dfrac{a^x}{\log_e(ae)} + C$
- **C** $(ae)^x + C$
- **D** $\dfrac{a^x e^x}{1+\log_e a} + C$

$\Rightarrow \int e^{\log_e a^x} \cdot e^x \, dx$

$\Rightarrow \int a^x \cdot e^x \, dx$

$\Rightarrow \int (ae)^x \, dx$

$\Rightarrow \dfrac{(ae)^x}{\log_e(ae)} + C$

$\dfrac{(ae)^x}{\log_e a + \log_e e} + C$

$\Rightarrow \dfrac{(ae)^x}{(1+\log_e a)} + C$

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Question: CUET 2026 PYQs

$\int \frac{1-\sin x}{\cos^2 x}\,dx$ **is equal to:**
(where c is an arbitrary constant)

A. $\cot x - \csc x + c$

B. $\csc x - \cot x + c$

C. $\sec x - \tan x + c$

D. $\tan x - \sec x + c$ ✓

$$\Rightarrow \int \left[\frac{1}{\cos^2 x} - \left(\frac{\sin x}{\cos x}\right)\cdot\frac{1}{\cos x}\right]dx$$

$$\Rightarrow \int (\sec^2 x - \tan x \cdot \sec x)\,dx$$

$$\Rightarrow \tan x - \sec x + c$$

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Question: CUET 2026 PYQs

$\int \sqrt[3]{x}(x^3 + 4x^2 + 7)\,dx$ **is equal to-**

$\int x^{1/3}\left(x^3+4x^2+7\right)dx \Rightarrow \int\left(x^{10/3} + 4x^{7/3} + 7x^{1/3}\right)dx \Rightarrow \frac{3}{13}x^{13/3} + 4\frac{3x^{10/3}}{10} + 7\frac{3x^{4/3}}{4}$

(A) $3[13x^{\frac{3}{13}} + \frac{5}{2}x^{\frac{3}{10}} + \frac{4}{7}x^{\frac{3}{4}}] + C$, **where C is an arbitrary constant.**

(B) $3[\frac{1}{13}x^{\frac{13}{3}} + \frac{2}{5}x^{\frac{10}{3}} + \frac{7}{4}x^{\frac{4}{3}}] + C$, **where C is an arbitrary constant.**

$\Rightarrow 3\left[\frac{1}{13}x^{13/3} + \frac{2}{5}x^{10/3} + \frac{7}{4}x^{4/3}\right]$

(C) $\frac{1}{3}[\frac{1}{13}x^{13/3} + \frac{5}{2}x^{10/3} + \frac{7}{4}x^{4/3}] + C$, **where C is an arbitrary constant.**

(D) $3[13x^{\frac{3}{13}} + \frac{2}{5}x^{\frac{10}{3}} + \frac{4}{7}x^{\frac{4}{3}}] + C$, **where C is an arbitrary constant.**

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Question: CUET 2026 PYQs

If $\int \frac{d}{dx}[f(x)] = \int 5x^4 - \frac{2}{x^3}$ such that $f\left(-\frac{1}{2}\right) = 0$, then $f(x)$ is equal to

A. $x^5 + \frac{1}{x^2} - \frac{127}{32}$

B. $x^4 - \frac{1}{x^3} + \frac{127}{32}$

C. $x^5 + \frac{1}{x^2} + \frac{127}{32}$

D. $x^4 + \frac{1}{x^3} - \frac{127}{32}$

$f(x) \Rightarrow \frac{5x^5}{5} - 2\left(\frac{-1}{2x^2}\right) + C$

$f(x) = x^5 + \frac{1}{x^2} + C$

put $x = -\frac{1}{2}$

$f\left(-\frac{1}{2}\right) = \left(-\frac{1}{2}\right)^5 + \frac{1}{\left(-\frac{1}{2}\right)^2} + C$

$0 = \frac{-1}{32} + 4 + C$

$C = \frac{-127}{32}$

$f(x) = x^5 + \frac{1}{x^2} - \frac{127}{32}$

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Question: CUET 2026 PYQs

Integral $I = \int \frac{e^{3\log x} - 3x^4}{e^{2\log x} + x^2}\,dx$ **(where** $x > 0$**) is equal to**

$I = \int \frac{e^{\log x^3} - 3x^4}{e^{\log x^2} + x^2}\,dx \Rightarrow \int \frac{x^3 - 3x^4}{x^2 + x^2}\,dx \Rightarrow \int \frac{x^3(1-3x)}{2x^2}\,dx$

(A) $\frac{1}{2}x - \frac{3}{2}x^2 + C$, **where C is an arbitrary constant**

(B) $\frac{1}{4}x - \frac{1}{2}x^2 + C$, **where C is an arbitrary constant**

$\Rightarrow \frac{1}{2}\int (x - 3x^2)\,dx$

(C) $\frac{1}{2}x^2 - \frac{3}{4}x^3 + C$, **where C is an arbitrary constant**

$\Rightarrow \frac{1}{2}\left[\frac{x^2}{2} - \frac{3x^3}{3}\right] + C$

(D) $\frac{1}{4}x^2 - \frac{1}{2}x^3 + C$, **where C is an arbitrary constant**

$\Rightarrow \frac{1}{2}\left[\frac{x^2}{2} - x^3\right] + C$

Question: CUET 2026 PYQs

Value of $\int (e^{2\log x} + e^{x\log 2} + e^{2\log 2})\,dx$ **is**

$\Rightarrow \int \left[e^{\log x^2} + e^{\log 2^x} + e^{\log 2^2}\right] dx$

(A) $\frac{x^3}{3} + 2^x \log 2 + 4x + C$: **where C is an arbitrary constant**

(B) $\frac{x^3}{3} + \frac{2^x}{\log 2} + 4x + C$: **where C is an arbitrary constant**

(C) $\frac{x^3}{3} + 2^x \log 2 + C$: **where C is an arbitrary constant**

(D) $\frac{x^3}{3} + \frac{2^x}{\log 2} + C$: **where C is an arbitrary constant**

$\Rightarrow \int \left(x^2 + 2^x + 4\right) dx \Rightarrow \left(\frac{x^3}{3} + \frac{2^x}{\log 2} + 4x\right) + C$

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Question: CUET 2026 PYQs

$x = \sqrt{x}\sqrt{x}$

$(x+1) = (\sqrt{x+1})(\sqrt{x+1})$

$\int \frac{1+x+\sqrt{x+x^2}}{\sqrt{1+x}+\sqrt{x}}\,dx$ **is equal to (Where c is an arbitrary constant)**

$\int \frac{(\sqrt{x+1})(\sqrt{x+1}) + \sqrt{x(1+x)}}{(\sqrt{1+x} + \sqrt{x})}\,dx$

(A) $\frac{3}{2}(1+x)^{\frac{3}{2}} + c$

(B) $\frac{2}{3}(1+x)^{\frac{3}{2}} + c$

(C) $\frac{2}{3}(1+x)^{\frac{3}{2}} + \frac{2}{3}x^{\frac{2}{3}} + c$

(D) $\frac{2}{3}\frac{1}{(1+x)^{\frac{3}{2}}} + c$

$\Rightarrow \int \frac{\sqrt{x+1}\left(\sqrt{x+1} + \sqrt{x}\right)}{\left(\sqrt{x+1} + \sqrt{x}\right)}\,dx$

$\Rightarrow \int \sqrt{x+1}\,dx \Rightarrow \frac{2}{3}(x+1)^{3/2} + C$

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Question: CUET 2026 PYQs

$\int 5^x \, dx$ **is**
(where C is an arbitrary constant)

(A) $5^x \log_e 5 + C$

(B) $5^x \log_e x + C$

(C) $\frac{5^x}{\log_e x} + C$

(D) $\frac{5^x}{\log_e 5} + C$



Question: CUET 2026 PYQs

$\int \frac{e^{7\log x} - e^{6\log x}}{e^{5\log x} - e^{4\log x}}\,dx$, $x > 0$ and $x \neq 1$ is equal to (consider $\log x = \log_e x$)

A. $\frac{x^5}{5} + C$, where C is an arbitrary constant.

B. $\frac{x^7}{7} + C$, where C is an arbitrary constant.

C. $\frac{x^8}{8} + C$, where C is an arbitrary constant.

D. $\frac{x^3}{3} + C$, where C is an arbitrary constant.

HW

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#Q. $\int \frac{x^3-1}{x^2} dx$ is equal to

$\Rightarrow \int \left(x - \frac{1}{x^2}\right) dx \Rightarrow \frac{x^2}{2} + \frac{1}{x} + c$

A $\frac{x^2}{2} + x + c$, Where c is constant of integration

B $\frac{x^2}{2} - \frac{1}{x} + c$, Where c is constant of integration

C $\frac{x^2}{2} - x + c$, Where c is constant of integration

D $\frac{x^2}{2} + \frac{1}{x} + c$, Where c is constant of integration

Question – CUET 2025 PYQs

#Q. The integral $I = \int \frac{e^{5\log_e x} - e^{4\log_e x}}{e^{3\log_e x} - e^{2\log_e x}} dx$ is equal to

HW

A $\frac{x}{2} + C$, where C is the constant of integration

B $\frac{x^2}{2} + C$, where C is the constant of integration

C $\frac{x^3}{3} + C$, where C is the constant of integration

D $\frac{x^4}{4} + C$, where C is the constant of integration

SSR SIR

Question – CUET 2025 PYQs

#Q. If $2f(x) + f\left(\frac{1}{x}\right) = x^2 + 1$, then $\int f(x)dx$ is: (Here C is an arbitrary constant)

A $\frac{1}{3}\left(\frac{2}{3}x^3 + \frac{1}{x} + x\right) + C$

B $\frac{2}{3}x^3 - \frac{1}{x} + x + C$

C $\frac{x^3}{3} + x + C$

D $\frac{1}{3}\left(\frac{2}{3}x^3 - x\right) + C$

$2f(x) + f\left(\frac{1}{x}\right) = x^2 + 1$ — (1)

$x \to \left(\frac{1}{x}\right)$

$2f\left(\frac{1}{x}\right) + f(x) = \frac{1}{x^2} + 1$ — (2)

$f\left(\frac{1}{x}\right) = x^2 + 1 - 2f(x)$

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$$2\left[x^2+1-2f(x)\right]+f(x)=\frac{1}{x^2}+1$$

$$2x^2+2-4f(x)+f(x)=\frac{1}{x^2}+1$$

$$2x^2-\frac{1}{x^2}+1=3f(x)$$

$$\boxed{f(x)=\frac{1}{3}\left[2x^2-\frac{1}{x^2}+1\right]}$$

$$\int f(x)\,dx=\int\frac{1}{3}\left[2x^2-\frac{1}{x^2}+1\right]dx$$

$$\Rightarrow \frac{1}{3}\left[\frac{2x^3}{3}+\frac{1}{x}+x\right]+C$$

Question – CUET 2025 PYQs

#Q. $\int (e^{x\log a} + e^{a\log x})dx$ is equal to (where $a > 1$)

$\Rightarrow \int \left(e^{\log_e a^x} + e^{\log_b x^a}\right) dx \Rightarrow \int (a^x + x^a)dx$

A $\frac{a^x}{\log a} + \frac{x^{a+1}}{a+1} + C$: C is an arbitrary constant

$\Rightarrow \frac{a^x}{\log_e a} + \frac{x^{a+1}}{(a+1)} + C$

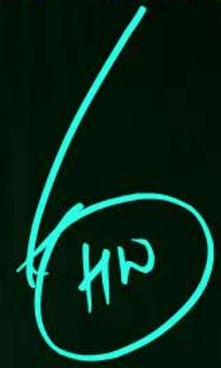
B $(\log a)a^x + \frac{x^{a+1}}{a+1} + C$: C is an arbitrary constant

C $\frac{a^x}{a+1} + \frac{x^{a+1}}{\log a} + C$: C is an arbitrary constant

D $(a+1)a^x + (\log a)x^{a+1} + C$: C is an arbitrary constant

Question – CUET 2025 PYQs

#Q. $\int \frac{e^{7\log_e x} - e^{6\log_e x}}{e^{4\log_e x} - e^{3\log_e x}} dx$ is equal to: (Here, c is an arbitrary constant)



A $-\frac{x}{2} + c$

B $\frac{x^2}{2} + c$

C $\frac{x^3}{3} + c$

D $\frac{x^4}{3} + c$

Question – CUET 2025 PYQs

#Q. $\int (x^4 + x^2 + 1)d(x^2)$ is equal to: (where c is an integration constant)

$x^2 = t$

$\int \left((x^2)^2 + (x^2) + 1\right) d(x^2)$

$\int (t^2 + t + 1)\,dt \Rightarrow \frac{t^3}{3} + \frac{t^2}{2} + t + C$

$\Rightarrow \frac{(x^2)^3}{3} + \frac{(x^2)^2}{2} + x^2 + C$

$\Rightarrow \frac{x^6}{3} + \frac{x^4}{2} + x^2 + C$

(A) $x^6 + x^4 + x^2 + C$

(B) $\frac{x^6}{6} + \frac{x^4}{4} + \frac{x^2}{2} + C$

(C) $\frac{x^6}{3} + \frac{x^4}{2} + x^2 + C$

(D) $x^6 + x^5 + x^4 + x^3 + x^2 + x + C$

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Question – CUET 2025 PYQs

#Q. $\int e^{(x\log 5)}e^{x}dx$, is: Where C is the constant of integration



A $\frac{5^x}{\log 5}e^x + C$

B $5^x e^x + C$

C $(5e)^x \log(5e) + C$

D $\frac{(5e)^x}{\log(5e)} + C$

Question

The value of $\int \tan^2 x \, dx$ is :

A $\sec^2 x + C$

B $\tan x - x + C$

C $\sec x + x + C$

D $\tan x + x + C$

where C is the constant of integration.

$\Rightarrow \int (\sec^2 x - 1) \, dx$

$\Rightarrow (\tan x - x) + C$

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Substitution Method

$$I = \int f'(x) \cdot f(x)\, dx$$

Let $f(x) = t$

$f'(x)\,dx = dt$

$$I = \int t\, dt \Rightarrow \frac{t^2}{2} + C$$

$$\Rightarrow \frac{[f(x)]^2}{2} + C$$

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4 Special Integral Formulas

(I) $\int \tan x dx = \ln|\sec x| + C$

(II) $\int \cot x dx = \ln|\sin x| + C$

(III) $\int \sec x dx = \ln|\sec x + \tan x| + C$

(IV) $\int \csc x dx = \ln|\csc x - \cot x| + C$

$\int \frac{\sin x}{\cos x} dx$

$\cos x = t$

$-\sin x dx = dt$

$\int \frac{-dt}{t} \Rightarrow -\ln|t| + c$

$\Rightarrow -\ln|\cos x| + c$

$\Rightarrow \ln|\sec x| + c$

$\int \frac{\sec x(\sec x + \tan x)}{(\sec x + \tan x)} dx$

t

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Question: CUET 2026 PYQs

Value of $\int x^3 \sqrt{1-x^2}\, dx$ is:

(A) $\frac{1}{5}(1-x^2)^5 - \frac{1}{3}(1-x^2)^3 + C$; where C is an arbitrary constant

(B) $\frac{1}{5}(1-x^2)^{\frac{5}{2}} + \frac{1}{3}(1-x^2)^{\frac{3}{2}} + C$; where C is an arbitrary constant

(C) $\frac{1}{5}(1-x^2)^{\frac{5}{2}} - \frac{1}{3}(1-x^2)^{\frac{3}{2}} + C$; where C is an arbitrary constant

(D) $\frac{2}{5}(1-x^2)^{\frac{5}{2}} - \frac{2}{3}(1-x^2)^{\frac{3}{2}} + C$; where C is an arbitrary constant

$I = \int x \cdot x^2 (\sqrt{1-x^2})\, dx \longrightarrow I = \int (1-t)\sqrt{t} \left(-\frac{1}{2}\right) dt$

$1-x^2 = t \Rightarrow x^2 = (1-t)$

$(-2x)\, dx = dt$

$x\, dx = -\frac{1}{2} dt$

$\Rightarrow -\frac{1}{2}\int \sqrt{t} - t^{3/2}\, dt$

$\Rightarrow -\frac{1}{2}\left[\frac{2}{3}t^{3/2} - \frac{2t^{5/2}}{5}\right] + \uparrow$

$\Rightarrow -\frac{1}{2}\left[\frac{2}{3}(1-x^2)^{3/2} - \frac{2}{5}(1-x^2)^{5/2}\right]$

$\Rightarrow \frac{1}{2}(1-x^2)^{5/2} - \frac{1}{3}(1-x^2)^{3/2}$

Question: CUET 2026 PYQs

$\int \frac{x-1}{x(x-\log x)}\,dx$ **equals:**

(consider: $\log x = \log_e x$**)**

A. $\log|x-\log x| + C$, **C is an arbitrary constant.**

B. $\log|x+\log x| + C$, **C is an arbitrary constant.**

C. $(x-1) + \log x + C$, **C is an arbitrary constant.**

D. $2\log|(x-1)+\log x| + C$, **C is an arbitrary constant.**

$$I = \int \frac{\frac{x-1}{x}}{(x-\log x)}\,dx \Rightarrow \int \frac{\left(1-\frac{1}{x}\right)}{(x-\log x)}\,dx$$

$(x-\log x) = t$

$\left(1-\frac{1}{x}\right)dx = dt$

$$I = \int \frac{dt}{t}$$

$\Rightarrow \log|t| + C$

$\Rightarrow \log|x-\log x| + C$

SSR SIR

Question: CUET 2026 PYQs

$\int x\sqrt{x^2-1}\,dx$ **is equal to: (where C is an arbitrary constant)**

(A) $\frac{1}{\sqrt{x^2-1}} + C$

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

(C) $\frac{1}{3}(x^2-1)^{3/2} + C$

(D) $\frac{-1}{\sqrt{x^2-1}} + C$

$x^2-1 = t$

$(2x)dx = dt$

$x\,dx = \frac{1}{2}dt$

$I = \int \sqrt{t}\,\frac{1}{2}\,dt$

$\Rightarrow \frac{1}{2}\left[\frac{2}{3}t^{3/2}\right] + C \quad \Rightarrow \frac{1}{3}\left(x^2-1\right)^{3/2} + C$

SSR SIR

Question: CUET 2026 PYQs 2025

$\int \frac{1}{(x-1)^{3/4}(x+2)^{5/4}}\,dx$ **is equal to: [where C is an arbitrary constant]**

A. $\frac{3}{4}\left(\frac{x-1}{x+2}\right)^{3/4} + C$

B. $\frac{4}{3}\left(\frac{x-1}{x+2}\right)^{1/4} + C$

C. $\frac{4}{3}\left(\frac{x-1}{x+2}\right)^{-1/4} + C$

D. $\frac{3}{4}\left(\frac{x+2}{x-1}\right)^{3/4} + C$

Question – CUET 2025 PYQs

#Q. If $\int \frac{dx}{(x-1)^{3/4}.(x+2)^{5/4}} = \alpha[1-g(x)]^{\beta} + c$, where c is a constant of integration, then which of the following are true?

(A) $\alpha = \frac{2}{3}$ (B) $\beta = \frac{3}{4}$

(C) $3\alpha + 4\beta = 5$ (D) $g(x) = \frac{3}{(x+2)}$

Choose the correct answer from the options given below:

A (A), (B) and (D) only

B (A), (B) and (C) only

C (A), (B), (C) and (D)

D (C) and (D) only

$I \Rightarrow \frac{4}{3}\left[\frac{x-1}{x+2}\right]^{1/4} + c$

$\Rightarrow \frac{4}{3}\left[1 - \frac{3}{(x+2)}\right]^{1/4}$

$\alpha = 4/3, \ \beta = \frac{1}{4}$

$g(x) = \frac{3}{(x+2)}$

$I = \int \frac{dx}{(x-1)^{3/4}.\frac{(x+2)^{5/4}}{(x-1)^{5/4}} \cdot (x-1)^{5/4}}$

$\frac{3}{4} + \frac{5}{4} \Rightarrow \frac{8}{4} = 2$

$I = \int \frac{dx}{(x-1)^2\left[\frac{x+2}{x-1}\right]^{5/4}}$

(C) $\beta(\frac{4}{3}) + 4(\frac{1}{4})$

$\Rightarrow 5$

SSR SIR

Let $\frac{x+2}{x-1} = t$

$$\left[\frac{1(x-1) - (x+2)1}{(x-1)^2}\right] dx = dt$$

$$\frac{-3}{(x-1)^2} dx = dt$$

$$\frac{1}{(x-1)^2} dx = -\frac{1}{3} dt$$

$$I = \int \frac{-\frac{1}{3} dt}{t^{5/4}}$$

$$I = -\frac{1}{3} \int t^{-5/4} dt$$

$$I = -\frac{1}{3} \frac{t^{-1/4}}{-1/4}$$

$$I = \frac{4}{3} t^{-1/4} + C$$

$$I = \frac{4}{3}\left[\frac{x+2}{x-1}\right]^{-1/4} + C \Rightarrow \frac{4}{3}\left[\frac{x-1}{x+2}\right]^{1/4} + C$$

Question: CUET 2026 PYQs

The integral $I = \int \frac{(1+\log\ x)^3}{x} dx$ equals:

A $\frac{1}{x^4} + C$, **Where C is an arbitrary constant**

B $\frac{(1+\log\ x)^4}{4} + C$, **Where C is an arbitrary constant**

C $\frac{\log\ x}{x^3} + C$, **Where C is an arbitrary constant**

D $\frac{(1+\log\ x)^3}{3} + C$, **Where C is an arbitrary constant**

$1+\log x = t$

$\left(\frac{1}{x}\right) dx = dt$

$I = \int t^2\, dt$

$\Rightarrow \frac{t^3}{3} + C$

$\Rightarrow \frac{1}{3}\left[1+\log x\right]^3 + C$

Question: CUET 2026 PYQs

$\int x^3\sqrt{7-x^2}\,dx$ **is equal to (where C is an arbitrary constant)**

$x^2 \cdot x \sqrt{7-x^2}$

HW

A $\frac{7}{3}(7-x^2)^{3/2} + \frac{1}{5}(7-x^2)^{5/2} + C$

B $\frac{7}{3}(7-x^2)^{1/2} + \frac{1}{5}(7-x^2)^{3/2} + C$

C $-\frac{7}{3}(7-x^2)^{3/2} + \frac{1}{5}(7-x^2)^{5/2} + C$

D $-\frac{7}{3}(7-x^2)^{3/2} - \frac{1}{5}(7-x^2)^{5/2} + C$

Question: CUET 2026 PYQs

If $\int \frac{x^3\,dx}{\sqrt{1+x^2}} = a(1+x^2)^{3/2} + b\sqrt{1+x^2} + c$, where C is an arbitrary constant, then the value of a and b are

A. $a = \frac{1}{3}, b = 1$

B. $a = -\frac{1}{3}, b = 1$

C. $a = -\frac{1}{3}, b = -1$

D. $a = \frac{1}{3}, b = -1$

$\int \frac{x^2 \cdot x\,dx}{\sqrt{1+x^2}} \Rightarrow \int \frac{1}{2}\frac{(t-1)}{\sqrt{t}}\,dt$

$(1+x^2) = t$

$x^2 = (t-1)$

$2x\,dx = dt$

$x\,dx = \frac{1}{2}dt$

$\Rightarrow \frac{1}{2}\int \left(\sqrt{t} - \frac{1}{\sqrt{t}}\right)dt$

$\Rightarrow \frac{1}{2}\left[\frac{2}{3}t^{3/2} - 2\sqrt{t}\right] + C$

$\Rightarrow \frac{1}{3}(1+x^2)^{3/2} - (1+x^2)^{1/2} + C$

$a = 1/3$

$b = -1$

SSR SIR

#Q. Match List-I with List-II (where c is an arbitrary constant)

List-I	List-II
(A) $\int \tan\ x dx$	(I) $\log\ \lvert\sec\ x + \tan\ x\rvert + c$
(B) $\int \cot\ x dx$	(II) $\log\ \lvert\sec\ x\rvert + c$
(C) $\int \sec\ x dx$	(III) $\log\ \lvert\sin\ x\rvert + c$
(D) $\int \operatorname{cosec} x dx$	(IV) $\log\ \lvert\operatorname{cosec} x - \cot\ x\rvert + c$

Choose the correct answer from the options given below:

A (A) - (II), (B) - (IV), (C) - (I), (D) - (III)

B (A) - (III), (B) - (II), (C) - (IV), (D) - (I)

C (A) - (II), (B) - (III), (C) - (I), (D) - (IV)

D (A) - (III), (B) - (IV), (C) - (II), (D) - (I)

Question – CUET 2025 PYQs

#Q. $\int \frac{e^x(1+x)dx}{\cos^2(e^x x)}$ is equal to

$e^x \cdot x = t$

$(e^x + x e^x)dx = dt$

$e^x(1+x)dx = dt$

$I = \int \frac{dt}{\cos^2 t} \Rightarrow \int \sec^2 t\, dt$

$\Rightarrow \tan t + C$

$\Rightarrow \tan[e^x \cdot x] + C$

A $\tan(e^x) + c$, where c is constant of integration

B $-\cot(ex^x) + c$, where c is constant of integration

C $\cot(e^x) + c$, where c is constant of integration .

D $\tan(xe^x) + c$, where c is constant of integration

SSR SIR

Question – CUET 2025 PYQs

#Q. $\int \frac{f'(x)}{f(x)\log_e[f(x)]}dx$ is equal to

$\int \frac{dt}{t} \Rightarrow \log|t| + C$

A. $f(x) \cdot \log_e[f(x)] + C$: C is a constant of integration

$\Rightarrow \log|\log|f(x)|| + C$

B. $\frac{\log_e[f(x)]}{f(x)} + C$: C is a constant of integration

C. $\log_e(\log_e[f(x)]) + C$: C is a constant of integration

D. $\frac{\log_o(\log_o[f(x)])}{f(x)} + C$: C is a constant of integration

SSR SIR

Question – CUET 2025 PYQs

#Q. $\int \left(\frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha}\right) dx =$ (Given that c is an arbitrary constant)

$$\Rightarrow \int \frac{(2\cos^2 x - 1) - (2\cos^2 \alpha - 1)}{(\cos x - \cos \alpha)} dx$$

$$\Rightarrow \int \frac{2(\cos^2 x - \cos^2 \alpha)}{(\cos x - \cos \alpha)} dx$$

$$\Rightarrow \int \frac{2(\cos x + \cos \alpha)(\cos x - \cos \alpha)}{(\cos x - \cos \alpha)} dx$$

$$I = \int 2(\cos x + \cos \alpha) dx$$

$$I = 2\left[\sin x + (\cos \alpha) \cdot x\right] + C$$

A $2\sin x + 2x\cos \alpha + c$

B $2\cos x + 2x\sin \alpha + c$

C $x\cos x + 2\sin \alpha + c$

D $x\cos x + x\sin \alpha + c$

SSR SIR

Question – CUET 2025 PYQs

#Q. If $\int \sqrt{\frac{1-x}{1+x}}\,dx = \alpha\sqrt{1-x^2} + \beta\sin^{-1}x + C$, Where C is an arbitrary constant, then which of the following are TRUE?

(A) $\alpha=1$
(B) $\alpha=-1$
(C) $\beta=1$
(D) $\beta=-1$

Choose the correct answer from the options given below:

A (B) and (D) only

B (A) and (C) only

C (A) and (D) only

D (B) and (C) only

$$I = \int \sqrt{\frac{1-x}{1+x}}\,dx$$

$$\Rightarrow \int \frac{\sqrt{1-x}}{\sqrt{1+x}} \times \frac{\sqrt{1-x}}{\sqrt{1-x}}\,dx \Rightarrow \int \frac{(1-x)}{\sqrt{1-x^2}}\,dx$$

$$\Rightarrow \int \frac{1}{\sqrt{1-x^2}}\,dx - \int \frac{x}{\sqrt{1-x^2}}\,dx$$

SSR SIR

$$I = \sin^{-1}x - \int \frac{-\frac{1}{2}\,dt}{\sqrt{t}}$$

$$1-x^2 = t$$

$$(-2x)\,dx = dt$$

$$x\,dx = -\frac{1}{2}dt$$

$$I = \sin^{-1}x + \frac{1}{2}\left(2\sqrt{t}\right) + C$$

$$I = \sin^{-1}x + \left(\sqrt{1-x^2}\right) + C$$

$\alpha = 1$

$\beta = 1$

#Q. If $I = \int \frac{x^4+x^2+1}{x^2-x+1} dx = \alpha x + \beta x^2 + \gamma x^3 + \delta$, δ is constant of integration then $(\alpha + 2\beta + 3\gamma)$ equals

$$(x^4+x^2+1) = (x^2+x+1)(x^2-x+1)$$

$$I = \int \frac{(x^2+x+1)(x^2-x+1)}{(x^2-x+1)} dx$$

$$\Rightarrow \left[\frac{x^3}{3} + \frac{x^2}{2} + x\right] + C$$

$\alpha = 1$, $\beta = \frac{1}{2}$, $\gamma = \frac{1}{3}$

$\alpha + 2\beta + 3\gamma$

$\Rightarrow 1 + 2\left(\frac{1}{2}\right) + 3\left(\frac{1}{3}\right)$

$\Rightarrow 3$

A. 0

B. 1

C. 3.2

D. 3

QUESTION: NCERT EXERCISE

$$\int \frac{10x^9+10^x \log_e 10 \, dx}{x^{10}+10^x} \text{ equals}$$

A $10^x - x^{10} + C$

B $10^x + x^{10} + C$

C $(10^x - x^{10})^{-1} + C$

D $\log(10^x + x^{10}) + C$

$x^{10} + 10^x = t$

$(10x^9 + 10^x \log 10)\, dx = dt$

$I = \int \frac{dt}{t} \Rightarrow \log|t| + C$

$\Rightarrow \log_y |x^{10} + 10^x| + C$

SSR SIR

The integral $\int \sec^{2/3} x \, cosec^{\frac{4}{3}} x \, dx$ *is equal to (here C is a constant* of integration)

a) $3tan^{-1/3}x + c$

b) $-3tan^{-1/3}x + c$

c) $-3cot^{-1/3}x + c$

d) $-\frac{3}{4}tan^{-4/3}x + c$

$$I = \int \frac{1}{\cos^{2/3} x \cdot \left[\frac{\sin^{4/3} x}{\cos^{4/3} x}\right] \cos^{4/3} x} dx$$

$$I = \int \frac{dx}{\cos^{2} x \cdot \tan^{4/3} x}$$



SSR SIR

$$I = \int \frac{\sec^2 x}{\tan^{4/3} x}\, dx$$

$$\tan x = t$$

$$\sec^2 x\, dx = dt$$

$$I = \int \frac{dt}{t^{4/3}}$$

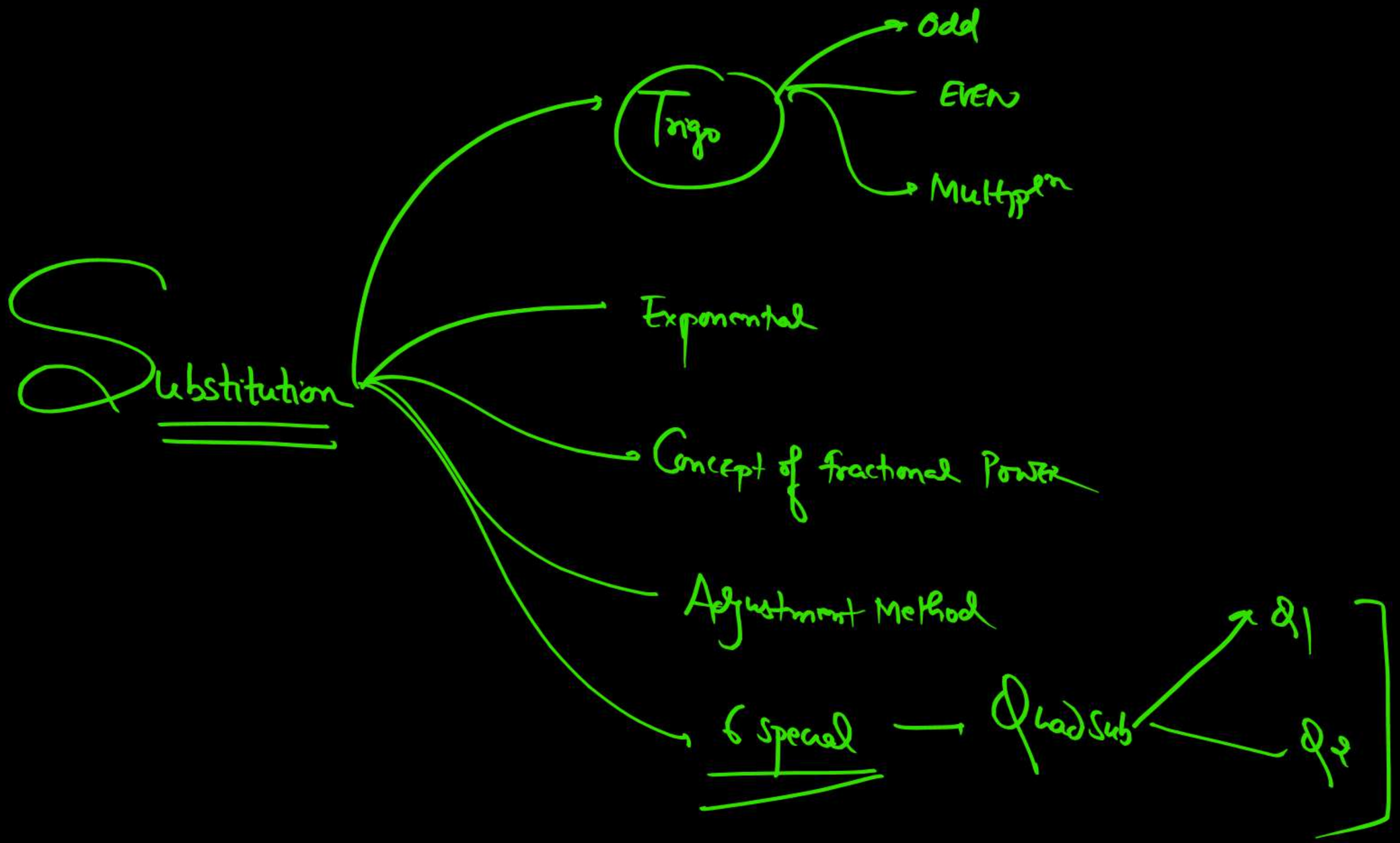
$$I = \int t^{-4/3}\, dt$$

$$I = \frac{t^{-4/3+1}}{\left(-\frac{4}{3}+1\right)} + C$$

$$I = \frac{t^{-1/3}}{-1/3} + C$$

$$I = -3 \cdot t^{-1/3} + C$$

$$\boxed{I = -3\left(\tan x\right)^{-1/3} + C}$$


Substitution
Trigo
Odd
EVEN
Multiple
Exponential
Concept of fractional Power
Adjustment Method
& special
Quad Sub
Q1
Q2



Trigonometric Substitution Method - Square

$$\sin^2 x = \frac{1-\cos 2x}{2}$$

$$\cos^2 x = \frac{1+\cos 2x}{2}$$

$\cos 2x = 1 - 2\sin^2 x$

$2\sin^2 x = 1 - \cos 2x$

$\sin^2 x = \left(\frac{1-\cos 2x}{2}\right)$

$\cos 2x = 2\cos^2 x - 1$

$(\cos 2x + 1) = 2\cos^2 x$

$\cos^2 x = \left(\frac{1+\cos 2x}{2}\right)$

$\left[\int \sin^m x \text{ & } \int \cos^m x \quad m: \text{EVEN}\right]$

By- SSR Sir



Trigonometric Substitution Method - Cubic

$$\sin 3x = 3\sin x - 4\sin^3 x$$

$$4\sin^3 x = 3\sin x - \sin 3x$$

$$\sin^{\overset{\text{Odd}}{3}} x = \frac{3\sin x - \sin 3x}{4}$$

$$\cos 3x = 4\cos^3 x - 3\cos x$$

$$4\cos^3 x = \cos 3x + 3\cos x$$

$$\cos^{\overset{\text{Odd}}{3}} x = \frac{\cos 3x + 3\cos x}{4}$$

$$\sin^3 x = \frac{1}{4}[3\sin x - \sin 3x]$$

$$\cos^3 x = \frac{1}{4}[3\cos x + \cos 3x]$$

By- SSR Sir

Question

$\int \sin^3 x dx$ is equal to :

$\Rightarrow \int \frac{1}{4}\left[3\sin x - \sin 3x\right] dx$

A $\frac{\cos^3 x}{3} + \cos x + C$

B $\frac{\cos^3 x}{3} - \cos x + C$

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

D $\frac{\sin^3 x}{3} + \sin x + C$

$\Rightarrow \frac{1}{4}\left[-3\cos x + \frac{\cos 3x}{3}\right]$

$\Rightarrow \frac{1}{4}\left[-3\cos x + \frac{1}{3}\left(4\cos^3 x - 3\cos x\right)\right]$

$\Rightarrow \frac{1}{4}\left[-3\cos x + \frac{4}{3}\cos 3x - \cos x\right]$

$\Rightarrow \frac{1}{4}\left[-4\cos x + \frac{4}{3}\cos 3x\right]$

$-\cos x + \frac{1}{3}\cos 3x + C$

SSR SIR



Multiplication of twp Trigonometric Function

$$2\sin A.\cos A = \sin 2A$$
$$2\sin A\cos B=\sin(A+B)+\sin(A-B)$$
$$2\cos A\sin B=\sin(A+B)-\sin(A-B)$$
$$2\cos A\cos B=\cos(A+B)+\cos(A-B)$$
$$2\sin A\sin B=\cos(A-B)-\cos(A+B)$$

By- SSR Sir

Question: CUET 2026 PYQs

$\int \sin\ 3x \sin\ 2x\ dx =$ **(where c is an arbitrary constant)**

A. $\frac{1}{2}\sin\ x - \frac{\sin\ 5x}{10} + c$

B. $\sin\ x + \sin\ 5x + C$

C. $\frac{1}{2}\cos\ x + \frac{\cos\ 5x}{10} + c$

D. $\cos\ x + \cos\ 5x + C$

$I = \int \frac{1}{2}(2\sin 3x \cdot \sin 2x)\,dx$

$I = \frac{1}{2}\int (\cos x - \cos 5x)\,dx$

$\Rightarrow \frac{1}{2}\left[\sin x - \frac{\sin 5x}{5}\right] + C$

$2\sin A \sin B = \cos(A-B) - \cos(A+B)$

SSR SIR

Question: CUET 2026 PYQs

$$\int \frac{1+\cos\theta}{1-\cos\theta}\, d\theta =$$

$$\int \frac{1+(\text{R}\cos^2\theta - \text{K})}{\text{K}-(1-\text{K}\sin^2\theta/2)} \Rightarrow \int (\cot^2\theta/2)\, d\theta \Rightarrow \int (\text{cosec}^2\theta/2 - 1)\, d\theta$$

$$\Rightarrow \frac{-(\cot\theta/2)}{1/2} - \theta + C$$

$$\Rightarrow -2(\cot(\theta/2)) - \theta + C$$

(A) $\tan\frac{\theta}{2} + \sec\frac{\theta}{2} + c$, **where c is an arbitrary constant**

(B) $\tan\frac{\theta}{2} + \theta + c$, **where c is an arbitrary constant**

(C) $\cot\left(\frac{\theta}{2}\right) + \theta + c$, **where c is an arbitrary constant**

(D) ✓ $-2\cot\left(\frac{\theta}{2}\right) - \theta + c$, **where c is an arbitrary constant**

Question: CUET 2026 PYQs

If $0 < x < \frac{\pi}{4}$, then $\int \sqrt{1-\sin 2x}\, dx$ is: [where C is an arbitrary constant]

A. $\sin x + \cos x + C$

B. $\sin x - \cos x + C$

C. $-\sin x - \cos x + C$

D. $-\sin x + \cos x + C$

$$I = \int \sqrt{(\cos x - \sin x)^2}\, dx$$

$$I = \int |\cos x - \sin x|\, dx$$

$$\sqrt{x^2} = |x|$$

$x \in (0, \pi/4)$

$\Downarrow$

$\cos x > \sin x$

$\cos x - \sin x > 0$

$$I = \int ((\cos x - \sin x)\, dx$$

$$I = (\sin x + \cos x) + C$$

SSR SIR

Question: CUET 2026 PYQs

If $0 < x < \frac{\pi}{4}$, then $\int \sqrt{1 - \sin 2x}\, dx$ is: [where C is an arbitrary constant]

A. $\sin x + \cos x + C$

B. $\sin x - \cos x + C$

C. $-\sin x - \cos x + C$

D. $-\sin x + \cos x + C$

$$I = \int \sqrt{(\sin x - \cos x)^2}\, dx$$

$$I = \int |\sin x - \cos x|\, dx$$

$$\Rightarrow -\int (\sin x - \cos x)\, dx$$

$$\Rightarrow \int (\cos x - \sin x)\, dx \Rightarrow (\sin x + \cos x) + C$$

$0 < x < \pi/4$

$\cos x > \sin x$

$\sin x - \cos x \le 0$

$|\sin x - \cos x| = -(\sin x - \cos x)$

SSR SIR

Question: CUET 2026 PYQs

$$\int \frac{1\,dx}{\sin^2 x \cos^2 x} = \int \frac{\sin^2 x + \cos^2 x}{\sin^2 x \cdot \cos^2 x} dx \Rightarrow \left[\frac{\sin^2 x}{\sin^2 x \cdot \cos^2 x} + \frac{\cos^2 x}{\sin^2 x \cdot \cos^2 x}\right] dx$$

$$1 = (\sin^2 x + \cos^2 x)$$
$$1 = (\sec^2 x - \tan^2 x)$$

(A) $\tan x - \cot x + C$: Where c is an arbitrary constant

(B) $-x + C$: Where c is an arbitrary constant

(C) $x + C$: Where c is an arbitrary constant

(D) $\tan x + \cot x + C$: Where c is an arbitrary constant

$$\Rightarrow \int (\sec^2 x + \operatorname{cosec}^2 x)\, dx$$

$$\Rightarrow (\tan x - \cot x) + C$$

SSR SIR



Exponential Substitution

Q) $I = \int \frac{dx}{(1+e^x)} * \frac{e^{-x}}{e^{-x}}$

$I = \int \frac{e^{-x}\,dx}{(e^{-x}+1)}$

$e^x \cdot e^{-x} \Rightarrow e^0 = 1$

$1+e^{-x} = t$

$(-e^{-x})dx = dt$

$(e^{-x})dx = -dt$

$I = \int \frac{-dt}{t}$

$I = -\log|t| + C$

$I = -\log|1+e^{-x}| + C$

By- SSR Sir

9) $I = \int \frac{dx}{1 + e^{-x}} \Rightarrow \frac{e^x}{e^x}$

$$I = \int \frac{e^x\, dx}{e^x + 1}$$

$e^x \cdot e^{-x} = e^0 = 1$

Let $1 + e^x = t$

$e^x\, dx = dt$

$$I = \int \frac{dt}{t} \Rightarrow \log|t| + C \Rightarrow \log|1 + e^x| + C$$

Question: CUET 2026 PYQs

$\int \frac{1}{e^x - 1}\, dx$ **is equal to: (where C is an arbitrary constant)**



(A) $-(e^x - 1)^{-2}(e^x) + c$

(B) $\log_e \left|\frac{e^x}{e^x - 1}\right| + c$

(C) $\log_e \left|\frac{e^x - 1}{e^x}\right| + c$

(D) $e^x + c$

Question – CUET 2025 PYQs

#Q. The integral $\int \frac{2dx}{e^{2x}-1}$ is equal to:

$$\int \frac{2e^{-2x}}{1-e^{-2x}}dx$$

$$\left(1-e^{-2x}\right)=t$$

$$\left(2e^{-2x}\right)dx=dt$$

$$I=\int \frac{dt}{t}$$

$$I=\log|t|+C$$

$$I=\log\left|1-e^{-2x}\right|+C$$

$$I=\log\left|1-\frac{1}{e^{2x}}\right|+C$$

A. $\log|e^{2x}-1|+C$: C is an arbitrary constant

B. $\log\left|\frac{e^{2x}-1}{e^{2x}+1}\right|+C$: C is an arbitrary constant

C. $\log\left|\frac{e^{2x}}{e^{2x}-1}\right|+C$: C is an arbitrary constant

D. $\log\left|\frac{e^{2x}-1}{e^{2x}}\right|+C$: C is an arbitrary constant

$$I = \log \left| \frac{e^{2x} - 1}{e^{2x}} \right| + C$$

Concept of Fractional Power / Large power

$\frac{4}{3} \quad \frac{5}{17}$

$x^{9} \quad x^{15}$

By- SSR Sir

Question: CUET 2026 PYQs — 2022.

$$\int \frac{1}{x(x^6+1)}\,dx = \text{(consider } \log_e x = \log x\text{)}$$

A. $\frac{1}{6}\log\left|\frac{x^6}{x^6+1}\right| + C$, where C is an arbitrary constant

B. $\frac{1}{6}\log\left|\frac{x}{x^6+1}\right| + C$, where C is an arbitrary constant

C. $\frac{1}{5}\log\left|\frac{x}{x^5+1}\right| + C$, where C is an arbitrary constant

D. $\frac{1}{5}\log\left|\frac{x^5}{x^5+1}\right| + C$, where C is an arbitrary constant

$$I = \int \frac{dx}{x(x^6+1)}$$

Step 1: Sabse Badi power ko Common lelo

$$I = \int \frac{dx}{x \cdot x^6\left(1+\frac{1}{x^6}\right)}$$

$$I = \int \frac{dx}{x^7\left(1+x^{-6}\right)}$$

Step 2: Upper leke Jao

$$I = \int \frac{x^{-7}}{\left(1+x^{-6}\right)}dx$$

Step 3: Substitute $1+x^{-6}=t$

Let $1+x^{-6}=t$

$$-6x^{-7}\,dx = dt$$

$$x^{-7}\,dx = -\frac{1}{6}dt$$

$$I = \int \frac{-\frac{1}{6}dt}{t} \Rightarrow -\frac{1}{6}\log|t| + C$$

$$\Rightarrow -\frac{1}{6}\log\left|1+x^{-6}\right| + C$$

$$I = -\frac{1}{6}\log\left|1+\frac{1}{x^6}\right| + C$$

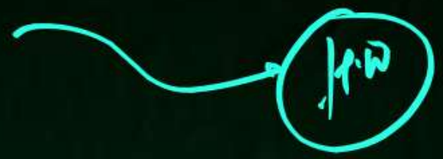
$$I = -\frac{1}{6}\log\left|\frac{x^6+1}{x^6}\right| + C$$

$$\boxed{I = \frac{1}{6}\log\left|\frac{x^6}{x^6+1}\right| + C}$$

Amy

Question: CUET 2026 PYQs

$\int \frac{dx}{x(x^{10}+1)}$ **is equal to**



(A) $\log \left|\frac{x^{10}}{x^{10}+1}\right| + C$, **where C is an arbitrary constant**

(B) $\log \left|\frac{x^{10}+1}{x^{10}}\right| + C$, **where C is an arbitrary constant**

(C) $\frac{1}{10}\log \left|\frac{x^{10}+1}{x^{10}}\right| + C$, **where C is an arbitrary constant**

(D) $\frac{1}{10}\log \left|\frac{x^{10}}{x^{10}+1}\right| + C$, **where C is an arbitrary constant**

Q) $I = \int \frac{dx}{x(x^n+1)}$

Question: CUET 2026 PYQs

$\int \frac{x^9}{(4x^2+1)^6}\,dx$ **is equal to:**

[where c is an arbitrary constant]

(A) $\frac{1}{5x}\left(4+\frac{1}{x^2}\right)^{-5}+c$

(B) $\frac{1}{5}\left(4+\frac{1}{x^2}\right)^{-5}+c$

(C) $\frac{1}{10x}(1+4)^{-5}+c$

(D) $\frac{1}{10}\left(\frac{1}{x^2}+4\right)^{-5}+c$

$$I=\int \frac{x^9}{\left[x^2\left(4+\frac{1}{x^2}\right)\right]^6}dx$$

$$I=\int \frac{x^9}{(x^2)^6\left[4+\bar{x}^2\right]^6}dx$$

$$I=\int \frac{\bar{x}^3}{\left(4+\bar{x}^2\right)^6}dx$$

Let $4+\bar{x}^2=t$

$$(-2\bar{x}^3)dx=dt$$

$$\bar{x}^3dx=-\frac{1}{2}dt$$

$$I=\int \frac{-\frac{1}{2}dt}{t^6}$$

$$I=-\frac{1}{2}\int t^{-6}\,dt$$

$$I=-\frac{1}{2}\frac{t^{-5}}{-5}+C$$

$$I=\frac{1}{10}\left[4+\frac{1}{x^2}\right]^{-5}+C$$

SSR SIR

Question: CUET 2026 PYQs

$\int \frac{x^8}{(x^3+1)^{1/3}}\,dx$ **is equal to**



A $\frac{1}{4}(x^3+1)^{4/3} - \frac{1}{2}(x^3+1)^{2/3} - \frac{2}{5}(x^3+1)^{1/3} + C$, **C is an arbitrary constant**

B $\frac{1}{4}(x^3+1)^{4/3} + \frac{1}{2}(x^3+1)^{2/3} - \frac{2}{5}(x^3+1)^{1/3} + C$, **C is an arbitrary constant**

C $\frac{1}{8}(x^3+1)^{8/3} - \frac{1}{2}(x^3+1)^{2/3} + \frac{2}{5}(x^3+1)^{5/3} + C$, **C is an arbitrary constant**

D $\frac{1}{8}(x^3+1)^{8/3} + \frac{1}{2}(x^3+1)^{2/3} - \frac{2}{5}(x^3+1)^{5/3} + C$, **C is an arbitrary constant**

Question – CUET 2025 PYQs

#Q. $\int \frac{(x^4-x)^{1/4}}{x^5}dx$ is equal to

$$\int \frac{\left[x^4\left(1-\frac{1}{x^3}\right)\right]^{1/4}}{x^5}dx$$

$$\Rightarrow \int \frac{x\left(1-\frac{1}{x^3}\right)^{1/4}}{x^5 \cdot x^4}dx$$

$$\Rightarrow \int \frac{1}{x^4}\left(1-\frac{1}{x^3}\right)^{1/4}dx$$

$1-\frac{1}{x^3} = t$

$-\left(\frac{-3}{x^4}\right)dx = dt$

$\frac{1}{x^4}dx = \frac{1}{3}dt$

A. $\frac{4}{15}\left(1-\frac{1}{x^3}\right)^{5/4}+C$: C is a constant of integration

B. $\frac{4}{3}\left(1-\frac{1}{x^3}\right)^{5/4}+C$: C is a constant of integration

C. $\frac{4}{15}\left(1-\frac{1}{x^3}\right)^{3/4}+C$: C is a constant of integration

D. $\frac{4}{15}\left(1-\frac{1}{x^3}\right)^{1/5}+C$: C is a constant of integration

SSR SIR

$$I = \int t^{1/4} \cdot \frac{1}{3}\, dt$$

$$I = \frac{1}{3} \cdot \frac{t^{5/4}}{5} + C$$

$$I = \frac{4}{15}\left[1 - \frac{1}{x^3}\right]^{5/4} + C$$

Question – CUET 2025 PYQs

#Q. $\int \frac{1}{x(x^5-1)}dx$ is equal to

HD

A $\frac{1}{5}\log_e\left|\frac{x^5-1}{x^5}\right| + C : C$ is an arbitrary constant

B $\log_e\left|\frac{x^5-1}{x^5}\right| + C : C$ is an arbitrary constant

C $\frac{1}{5}\left(\log_e|x| + \log_e|x^5-1|\right) + C : : C$ is an arbitrary constant

D $\log_e\left|\frac{x}{x^5-1}\right| + C : C$ is an arbitrary constant

6 Special Integral Formulas

(2022–26) = CUET

(I) $$\int \frac{1}{a^2+x^2}\,dx = \frac{1}{a}\tan^{-1}\left(\frac{x}{a}\right)+C$$

$\int \frac{1}{1+x^2} = \tan^{-1}x + C$

$a^2+x^2 \Rightarrow \frac{1}{a}$

(II) $$\int \frac{1}{x^2-a^2}\,dx = \frac{1}{2a}\ln\left|\frac{x-a}{x+a}\right|+C$$

(III) $$\int \frac{1}{a^2-x^2}\,dx = \frac{1}{2a}\ln\left|\frac{a+x}{a-x}\right|+C$$

(IV) $$\int \frac{1}{\sqrt{x^2+a^2}}\,dx = \ln\left|x+\sqrt{x^2+a^2}\right|+C$$

(V) $$\int \frac{1}{\sqrt{x^2-a^2}}\,dx = \ln\left|x+\sqrt{x^2-a^2}\right|+C$$

(VI) $$\int \frac{1}{\sqrt{a^2-x^2}}\,dx = \sin^{-1}\left(\frac{x}{a}\right)+C$$

$\int \frac{dx}{\sqrt{a^2-x^2}} = \sin^{-1}\frac{x}{a} + C$

By- SSR Sir

Question: CUET 2026 PYQs

If C is an arbitrary constant , then Match the LIST-I with LIST-II
Choose the correct answer from the options given below:

List-I	List-II
A. $\int a^x \, dx$	I. $\sin^{-1}\frac{x}{a} + C$
B. $\int \frac{dx}{\sqrt{a^2-x^2}}$	II. $\log_e \left\|x + \sqrt{x^2 - a^2}\right\| + C$
C. $\int \frac{dx}{\sqrt{a^2+x^2}}$	III. $\frac{a^x}{\log_e a} + C$
D. $\int \frac{dx}{\sqrt{x^2-a^2}}$	IV. $\log_e \left\|x + \sqrt{a^2 + x^2}\right\| + C$

(A) A-III, B-I, C-IV, D-II

(B) A-III, B-I, C-II, D-IV

(C) A-III, B-IV, C-II, D-I

(D) A-IV, B-III, C-II, D-I

SSR SIR

#Q. Match List-I with List-II (Given that c is an arbitrary constant)

List-I	List-II
(A) $\int \frac{dx}{\sqrt{a^2-x^2}} =$	(I) $\log_e \lvert x+\sqrt{x^2-a^2}\rvert + c$
(B) $\int \sqrt{a^2-x^2}dx =$	(II) $\sin^{-1}\frac{x}{a}+c$
(C) $\int \sqrt{x^2-a^2}dx =$	(III) $\frac{x}{2}\sqrt{a^2-x^2}+\frac{a^2}{2}\sin^{-1}\frac{x}{a}+c$
(D) $\int \frac{dx}{\sqrt{x^2-a^2}} =$	(IV) $\frac{x}{2}\sqrt{x^2-a^2}-\frac{a^2}{2}\log_e \lvert x+\sqrt{x^2-a^2}\rvert + c$

HW

Choose the correct answer from the options given below:

A. (A) - (III), (B) - (II), (C) - (IV), (D) - (I)

B. (A) - (IV), (B) - (I), (C) - (III), (D) - (II)

C. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

D. (A) - (II), (B) - (III), (C) - (IV), (D) - (I)

Question – CUET 2025 PYQs

#Q. Match List-I with List-II

List-I	List-II
Integral	Solution: C is an arbitrary constant
(A) $\int \frac{dx}{x^2+25}$	(1) $\frac{1}{10}\log\left\|\frac{5+x}{5-x}\right\| + C$
(B) $\int \frac{dx}{x^2-25}$	(II) $\log\left\|x+\sqrt{x^2-25}\right\| + C$
(C) $\int \frac{dx}{25-x^2}$	(III) $\frac{1}{5}\tan^{-1}\left(\frac{x}{5}\right) + C$
(D) $\int \frac{dx}{\sqrt{x^2-25}}$	(IV) $\frac{1}{10}\log\left\|\frac{x-5}{x+5}\right\| + C$

Choose the correct answer from the options given below:

A (A) - (I), (B) - (IV), (C) - (II), (D) - (III)

B (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

C (A) - (IV), (B) - (III), (C) - (I), (D) - (II)

D (A) - (II), (B) - (IV), (C) - (I), (D) - (III)

SSR SIR

Question – CUET 2025 PYQs

#Q. Match List-I with List-II

Choose the correct answer from the options given below:

List-I	List-II
(A) $\int \frac{dx}{x^2-16}$	(I) $\frac{1}{8}\log\left\|\frac{4+x}{4-x}\right\| + c$, Where C is an arbitrary constant,
(B) $\int \frac{dx}{x^2+16}$	(II) $\log\left\|x+\sqrt{x^2-16}\right\| + c$, Where C is an arbitrary constant,
(C) $\int \frac{dx}{16-x^2}$	(III) $\frac{1}{8}\log\left\|\frac{x-4}{x+4}\right\| + c$, Where C is an arbitrary constant,
(D) $\int \frac{dx}{\sqrt{x^2-16}}$	(IV) $\frac{1}{4}\tan^{-1}\left(\frac{x}{4}\right) + c$, Where C is an arbitrary constant,

A (A) - (IV), (B) - (I), (C) - (II), (D) - (III)

B (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

C (A) - (II), (B) - (III), (C) - (IV), (D) - (I)

D (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

HW

SSR SIR

Question – CUET 2025 PYQs

#Q. $\int \frac{dx}{9x^2-16}$ is equal to

$$\int \frac{dx}{(3x)^2-4^2} \Rightarrow \frac{1}{3\times 2\times 4}\log\left|\frac{3x-4}{3x+4}\right|+C$$

$$\Rightarrow \frac{1}{24}\log\left|\frac{3x-4}{3x+4}\right|+C$$

A $\frac{1}{24}\log_e\left|\frac{3x+4}{3x-4}\right|+C$, Where C is constant of integration

B $\frac{3}{8}\log_e\left|\frac{3x+4}{3x-4}\right|+C$, Where C is constant of integration

C $\frac{3}{8}\log_e\left|\frac{3x-4}{3x+4}\right|+C$, Where C is constant of integration

D $\frac{1}{24}\log_e\left|\frac{3x-4}{3x+4}\right|+C$, Where C is constant of integration

Question – CUET 2025 PYQs

#Q. $\int \frac{\sin 2x\, dx}{\sqrt{9-\cos^4 x}}$ equals

$\Rightarrow \int \frac{\sin 2x}{\sqrt{9-(\cos^2 x)^2}} dx$

Let $\cos^2 x = t$

$2(\cos x)(-\sin x)dx = dt$

$-\sin 2x\, dx = dt$

$(\sin 2x)dx = -dt$

$I = \int \frac{-dt}{\sqrt{9-t^2}}$

$I = \int \frac{-dt}{\sqrt{3^2-t^2}}$

$I = -\sin^{-1}(t/3) + C$

$I = -\sin^{-1}\left[\frac{\cos^2 x}{3}\right] + C$

A. $\sin^{-1}\left(\frac{\cos^2 x}{3}\right) + C$, C is an arbitrary constant.

B. $\cos^{-1}\left(\frac{\sin^2 x}{3}\right) + C$, C is an arbitrary constant.

C. $\sin\left(\frac{\cos^2 x}{3}\right) + C$, C is an arbitrary constant.

D. $-\sin^{-1}\left(\frac{\cos^2 x}{3}\right) + C$, C is an arbitrary constant

SSR SIR

Question – CUET 2025 PYQs

#Q. $\int \frac{dx}{e^x+e^{-x}}$ is equal to

$\Rightarrow \int \frac{dx}{e^x + \frac{1}{e^x}} \Rightarrow \int \frac{e^x\,dx}{e^{2x}+1}$

Let $e^x = t$

$e^x dx = dt$

$I = \int \frac{dt}{t^2+1}$

$I = \tan^{-1} t + C$

$I = \tan^{-1}[e^x] + C$

A $\tan^{-1}(e^x) + c$: c is an arbitrary constant

B $\tan^{-1}(e^{-x}) + c$: c is an arbitrary constant

C $\log(e^x - e^{-x}) + c$: c is an arbitrary constant

D $\log(e^x + e^{-x}) + c$: c is an arbitrary constant



3 Special Integral Formulas

(I) $$\int \sqrt{x^2+a^2}\,dx = \frac{1}{2}x\sqrt{x^2+a^2} + \frac{a^2}{2}\log\left|x+\sqrt{x^2+a^2}\right| + C$$

(II) $$\int \sqrt{x^2-a^2}\,dx = \frac{x}{2}\sqrt{x^2-a^2} - \frac{a^2}{2}\log\left|x+\sqrt{x^2-a^2}\right| + C$$

(III) $$\int \sqrt{a^2-x^2}\,dx = \frac{1}{2}x\sqrt{a^2-x^2} + \frac{a^2}{2}\sin^{-1}\frac{x}{a} + C$$

By- SSR Sir

#Q. $\int \sqrt{1+\frac{x^2}{9}}\,dx$ is equal to (Where C is an arbitrary constant)

$\Rightarrow \int \frac{\sqrt{9+x^2}}{3}\,dx \Rightarrow \frac{1}{3}\left[\frac{x}{2}\sqrt{x^2+9} + \frac{9}{2}\log\left|x+\sqrt{x^2+9}\right|\right]$

A $\frac{1}{9}\left[\frac{9}{2}\log\left|x+\sqrt{x^2+9}\right| + \frac{x}{2}\sqrt{x^2+9}\right] + C$

B $3\left[\frac{9}{2}\log\left|x+\sqrt{x^2+9}\right| + \frac{x}{2}\sqrt{x^2+9}\right] + C$

C $\left[\frac{9}{2}\log\left|x+\sqrt{x^2+9}\right| + \frac{x}{2}\sqrt{x^2+9}\right] + C$

D $\frac{1}{3}\left[\frac{9}{2}\log\left|x+\sqrt{x^2+9}\right| + \frac{x}{2}\sqrt{x^2+9}\right] + C$

Question – CUET 2025 PYQs

#Q. $\int \frac{\sqrt{16+(\log x)^2}}{x}\,dx$ is equal to (where C is an arbitrary constant)

$\log x = t$

$\left(\frac{1}{x}\right)dx = dt$

$I = \int \sqrt{16+t^2}\,dt \Rightarrow \left[\frac{t}{2}\sqrt{16+t^2} + 8\log\left|t+\sqrt{16+t^2}\right|\right]$

$\Rightarrow \left[\frac{\log x}{2}\sqrt{16+(\log x)^2} + 8\log\left|\log x+\sqrt{16+(\log x)^2}\right|\right]$

A $2\log\left|\log x+\sqrt{16+(\log x)^2}\right| + \log x\sqrt{16+(\log x)^2}+C$

B $16\log\left|\log x+\sqrt{16+(\log x)^2}\right| + \frac{\log x}{2}\sqrt{16+(\log x)^2}+C$

C $8\log\left|\log x+\sqrt{16+(\log x)^2}\right| + \frac{\log x}{2}\sqrt{16+(\log x)^2}+C$

D $4\log\left|\log x+\sqrt{16+(\log x)^2}\right| + \frac{\log x}{2}\sqrt{16+(\log x)^2}+C$

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Adjustment Method

By- SSR Sir

Question

The integral $\int \frac{x^4+2}{x^2+1}dx$ is equal to

$$\Rightarrow \int \frac{(x^4-1)+1+2}{(x^2+1)}dx \Rightarrow \int \frac{(x^2+1)(x^2-1)+3}{(x^2+1)}dx \Rightarrow \int \frac{(x^2+1)(x^2-1)}{(x^2+1)} + \frac{3}{(x^2+1)}dx$$

A $\frac{1}{3}x^3 - x + 3\tan^{-1}x + c$, where c is a constant

$\Rightarrow \frac{x^3}{3} - x + 3\tan^{-1}x + c$

B $\frac{1}{3}x^3 + x + 3\tan^{-1}x + c$, where c is a constant

C $\frac{1}{3}x^3 + x - 3\tan^{-1}x + c$, where c is a constant

D $\frac{1}{3}x^3 - x - 3\tan^{-1}x + c$, where c is a constant

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$$(a \pm b)^2 = a^2 + b^2 \pm 2ab$$

$$a^2 + b^2 = (a+b)^2 - 2ab$$

$$\Rightarrow (a-b)^2 + 2ab$$

$$a^3 + b^3 = (a+b)(a^2 + b^2 - ab)$$

$$a^3 - b^3 = (a-b)(a^2 + b^2 + ab)$$

$$(x^3 + 1) = (x+1)(x^2 - x + 1)$$

$$(x^3 - 1) = (x-1)(x^3 + x + 1)$$

CUET PYQs

Q. If $\int \frac{x^3}{x+1} dx = q(x) - \log|x+1| + C$ then q(x) is equal to:

$$\int \frac{x^3+1-1}{(x+1)} dx$$

A $q(x) = \frac{x^3}{3} + x$

B $q(x) = \frac{x^2}{2} - x$

C $q(x) = x^2 - x + 1$

D $q(x) = \frac{x^3}{3} - \frac{x^2}{2} + x$

$$\Rightarrow \int \frac{(x^3+1)}{(x+1)} - \frac{1}{(x+1)} dx$$

$$\Rightarrow \int \frac{(x+1)(x^2-x+1)}{(x+1)} - \log|x+1| + C$$

$$\Rightarrow \boxed{\frac{x^3}{3} - \frac{x^2}{2} + x} - \log|x+1| + C$$

C

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CUET PYQs

Q. If $\int \frac{2x^2+3}{(x^2+1)(x^2+2)}\,dx = \lambda tan^{-1}\frac{x}{\sqrt{2}} + \mu tan^{-1}x + c$, where C is a constant of integration, then value of $\lambda^2 + \mu$ is:

$$I \Rightarrow \int \frac{(x^2+1)+(x^2+2)}{(x^2+1)(x^2+2)}\,dx$$

$$\Rightarrow \int \frac{(x^2+1)}{(x^2+1)(x^2+2)} + \frac{(x^2+2)}{(x^2+1)(x^2+2)}\,dx$$

$$\Rightarrow \int \frac{dx}{x^2+(\sqrt{2})^2} + \int \frac{1}{(x^2+1)}dx$$

$$\Rightarrow \frac{1}{\sqrt{2}}\tan^{-1}\left[x/\sqrt{2}\right] + \tan^{-1}x + C$$

$\lambda = \frac{1}{\sqrt{2}}$, $\mu = 1$

$\lambda^2 + \mu \Rightarrow \frac{1}{2} + 1 \Rightarrow \frac{3}{2}$

A) 7

B) 5

C) $\frac{3}{2}$

D) $\frac{3}{4}$

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CUET PYQs

Q. $\int \frac{x^2+4}{(x^2+3)(x^2+5)}dx = u\tan^{-1}\left(\frac{x}{\sqrt{3}}\right) + v\tan^{-1}\left(\frac{x}{\sqrt{5}}\right) + c$, where c is arbitrary constant, then value of $\frac{1}{u^2}+\frac{1}{v^2}$ is equal to:

1. 32
2. 16
3. 08
4. 04

$(2\sqrt{3})^2 + (2\sqrt{5})^2$

$\Rightarrow 12 + 20$

$\Rightarrow 32$

$$I = \int \frac{2(x^2+4)}{2(x^2+3)(x^2+5)}$$

$$I = \int \frac{2x^2+8}{2(x^2+3)(x^2+5)}dx$$

$$I = \frac{1}{2}\int \frac{(x^2+3)+(x^2+5)}{(x^2+3)(x^2+5)}dx$$

$$I = \frac{1}{2}\int \frac{(x^2+3)}{(x^2+3)(x^2+5)} + \frac{(x^2+5)}{(x^2+3)(x^2+5)}dx$$

$$I = \frac{1}{2}\int \frac{dx}{x^2+(\sqrt{5})^2} + \frac{dx}{x^2+(\sqrt{3})^2}$$

$$I = \frac{1}{2}\left[\frac{1}{\sqrt{5}}\tan^{-1}\left(x/\sqrt{5}\right) + \frac{1}{\sqrt{3}}\tan^{-1}\left(x/\sqrt{3}\right)\right] + C$$

$$I = \frac{1}{2\sqrt{5}}\tan^{-1}\left(x/\sqrt{5}\right) + \frac{1}{2\sqrt{3}}\tan^{-1}\left(x/\sqrt{3}\right) + C$$

$v = \frac{1}{2\sqrt{5}}$ $\quad u = \frac{1}{2\sqrt{3}}$

SSR SIR

CUET PYQs

$$\int \frac{2}{x^4-1}\,dx =$$

(A) $\log\left|\frac{x^2-1}{x^2+1}\right| + c$

(B) $2\tan^{-1}(x^2) + c$

(C) $\frac{1}{2}\log\left|\frac{x-1}{x+1}\right| - \tan^{-1}x + c$

(D) $\tan^{-1}x + \frac{1}{2}\log\left|\frac{x-1}{x+1}\right| + c$

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

$$\Rightarrow \int \frac{(x^2+1)-(x^2-1)}{(x^2+1)(x^2-1)}\,dx$$

$$\Rightarrow \int \frac{1}{(x^2-1)}\,dx - \int \frac{dx}{(x^2+1)}$$

$$\Rightarrow \frac{1}{2}\log\left|\frac{x-1}{x+1}\right| - \tan^{-1}x + c$$

SSR SIR

Quadratic Substitution - 1

To find the integral $\int \frac{dx}{ax^2+bx+c}$,

$\int \frac{dx}{\sqrt{ax^2+bx+c}}$

} 6 - special

$\int \sqrt{ax^2+bx+c}\ dx$] 3 special

Rule:

1. Make perfect Square
2. Use 6 Special or 3 Special Integral Formulas

By- SSR Sir

Question: CUET 2026 PYQs

If $\int \frac{1}{\sqrt{(x-1)(x-2)}}\,dx = \log\left|(x-m)+\sqrt{ax^2+bx+n}\right| + C$ **where c is an arbitrary constant and m, n, a and b are constant, then** $2m+n+a+b$ **is equal to:**

A. 3
B. 5
C. 10
D. 6

$$\Rightarrow \int \frac{dx}{\sqrt{x^2-3x+2}}$$

$$\Rightarrow \int \frac{dx}{\sqrt{\left(x-\frac{3}{2}\right)^2-\frac{9}{4}+2}}$$

$$\Rightarrow \int \frac{dx}{\sqrt{\left(x-\frac{3}{2}\right)^2-\frac{1}{4}}}$$

$$I = \int \frac{dx}{\sqrt{\left(x-\frac{3}{2}\right)^2-\left(\frac{1}{2}\right)^2}}$$

$$I = \log\left|\left(x-\frac{3}{2}\right)+\sqrt{1x^2-3x+2}\right| + C$$

$m = \frac{3}{2}$

$a = 1$

$b = -3$

$n = 2$

$\Rightarrow 2\left(\frac{3}{2}\right)+2+1-3$

$\Rightarrow 3$

SSR SIR

Question: CUET 2026 PYQs

If $f(x) = \int \sqrt{\frac{x+8}{x-8}}\, dx$; $f(8) = 24\log_e 2$, then $f(10)$ is equal to:

A. $6 + 32\log_e 2$

B. $6 + \tan^{-1}\frac{4}{5}$

C. $-5 + \sin^{-1}\frac{4}{5}$

D. $6 + \frac{1}{8}\log_e\left|\frac{4}{5}\right|$

$$f(x) = \int \frac{(\sqrt{x+8})(\sqrt{x+8})}{\sqrt{x-8}\sqrt{x+8}}\, dx$$

$$f(x) = \int \frac{x+8}{\sqrt{x^2-8^2}}$$

$$f(x) = \int \frac{x}{\sqrt{x^2-64}}\, dx + \int \frac{8}{\sqrt{x^2-8^2}}$$

$x^2-64 = t$

$2x\,dx = dt$

$$J = \int \frac{1/2\, dt}{\sqrt{t}} + 8\log\left|x+\sqrt{x^2-64}\right|$$

$$J = \frac{1}{2}(2\sqrt{t}) + 8\log\left|x+\sqrt{x^2-64}\right|$$

$$f(x) = \sqrt{x^2-64} + 8\log\left|x+\sqrt{x^2-64}\right| + C$$

$$f(8) \Rightarrow 0 + 8\log|8| + C$$

$$24\log 2 = 8\cdot\log 2^3 + C$$

$$24\log 2 - 24\log 2 + C$$

$C = 0$

$$f(x) = \sqrt{x^2-64} + 8\log\left|x+\sqrt{x^2-64}\right|$$

$$f(10) = 6 + 8\log|16|$$

$$\Rightarrow 6 + 8\log(2^4) \Rightarrow 6 + 32\log 2$$

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Question: CUET 2026 PYQs

$\int \frac{1}{x^2+4x+8}\, dx$ **is equal to (Where C is an arbitrary constant)**

A. $-2\tan^{-1}(x+2)$

B. $\tan^{-1}\frac{x+2}{2} + C$

C. $-\frac{1}{2}\tan^{-1}\frac{x+2}{2} + C$

D. $\frac{1}{2}\tan^{-1}\frac{x+2}{2} + C$

$$I = \int \frac{dx}{(x+2)^2 - 4 + 8}$$

$$I = \int \frac{dx}{(x+2)^2 + 4}$$

$$I = \int \frac{dx}{(x+2)^2 + 2^2} \Rightarrow \frac{1}{2}\tan^{-1}\left[\frac{x+2}{2}\right] + C$$

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Question – CUET 2025 PYQs

#Q. $\int \frac{dx}{\sqrt{5-4x-x^2}}$ is equal to

$$I = \int \frac{dx}{\sqrt{-\{x^2+4x-5\}}} \Rightarrow \int \frac{dx}{\sqrt{-\{(x+2)^2-4-5\}}} \Rightarrow \int \frac{dx}{\sqrt{9-(x+2)^2}}$$

(A) $\sin^{-1}\left(\frac{x+2}{3}\right)+C$: C is an arbitrary constant

(B) $\frac{1}{3}\sin^{-1}\left(\frac{x+2}{3}\right)+C$: C is an arbitrary constant

(C) $3\sin^{-1}\left(\frac{x+2}{3}\right)+C$: C is an arbitrary constant

(D) $\frac{1}{3}\sin^{-1}(x+2)+C$: C is an arbitrary constant

$$\Rightarrow \int \frac{dx}{\sqrt{3^2-(x+2)^2}}$$

$$\Rightarrow \sin^{-1}\left(\frac{x+2}{3}\right)+C$$

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Quadratic Substitution - 2

least Imp for CUET (2022-26) → (X)

(I) $\int \frac{px+q}{ax^2+bx+c}\,dx$ → $\frac{L}{Q}$

(II) $\int \frac{(px+q)\,dx}{\sqrt{ax^2+bx+c}}$ → $\frac{L}{\sqrt{Q}}$

Rule:

1. Linear = $\lambda.\frac{d(Quadratic)}{dx}+\mu$
2. $(px+q)=\lambda(2ax+b)+\mu$
3. Find value of λ and μ
4. Now break $I = I_1 + I_2$

I_1 → $\frac{f'(x)}{\sqrt{f(x)}}$ or $\frac{f'(x)}{f(x)}$

I_2 → $\frac{1}{Q}$ | $\frac{1}{\sqrt{Q}}$

By- SSR Sir

Partial Fraction Method

As per CUET : Not Very Imp.

S.No.	Form of the rational function	Form of the partial fraction
1.	$\frac{px+q}{(x-a)(x-b)}, a \neq b = \frac{A}{(x-a)} + \frac{B}{(x-b)}$	$\frac{A}{x-a} + \frac{B}{x-b}$
2.	$\frac{px+q}{(x-a)^2} = \frac{A}{(x-a)} + \frac{B}{(x-a)^2}$	$\frac{A}{x-a} + \frac{B}{(x-a)^2}$
3.	$\frac{px^2+qx+r}{(x-a)(x-b)(x-c)} = \frac{A}{(x-a)} + \frac{B}{(x-b)} + \frac{C}{(x-c)}$	$\frac{A}{x-a} + \frac{B}{x-b} + \frac{C}{x-c}$
4.	$\frac{px^2+qx+r}{(x-a)^2(x-b)} = \frac{A}{(x-a)} + \frac{B}{(x-a)^2} + \frac{C}{(x-b)}$	$\frac{A}{x-a} + \frac{B}{(x-a)^2} + \frac{C}{x-b}$
5.	$\frac{px^2+qx+r}{(x-a)(x^2+bx+c)} = \frac{A}{(x-a)} + \frac{(Bx+C)}{(x^2+bx+c)}$ where $x^2 + bx + c$ cannot be factorised further	$\frac{A}{x-a} + \frac{Bx+C}{x^2+bx+c}$,

(I) $\frac{px+q}{(x-a)(x-b)} = \frac{A}{(x-a)} + \frac{B}{(x-b)}$

(II) $\frac{px+q}{(x-a)^2} = \frac{A}{(x-a)} + \frac{B}{(x-a)^2}$

(III) $\frac{px+q}{ax^2+bx+c} = \frac{(Ax+B)}{ax^2+bx+c}$

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Question: CUET 2026 PYQs

Match the rational functions with the correct form of the partial fractions.

[$p, q, r, a, b, c, A, B, C$ are arbitrary constants]

Match List–I with List–II

List-I [Rational Function]	List-II [Partial Fraction]
(A) $\frac{px^2+qx+r}{(x-a)(x^2+bx+c)}$	(I) $\frac{A}{x-a}+\frac{B}{(x-a)^2}+\frac{C}{x-b}$
(B) $\frac{px^2+qx+r}{(x-a)^2(x-b)}, a \neq b$	(II) $\frac{A}{x-a}+\frac{B}{(x-a)^2}$
(C) $\frac{px^2+qx+r}{(x-a)(x-b)(x-c)}, a \neq b \neq c$	(III) $\frac{A}{x-a}+\frac{Bx+C}{x^2+bx+c}$
(D) $\frac{px+q}{(x-a)^2}$	(IV) $\frac{A}{x-a}+\frac{B}{x-b}+\frac{C}{x-c}$

Choose the correct answer from the options given below:

A (A) – (III), (B) – (IV), (C) – (I), (D) – (II)

B (A) – (III), (B) – (I), (C) – (II), (D) – (IV)

C (A) – (III), (B) – (II), (C) – (I), (D) – (IV)

D (A) – (III), (B) – (I), (C) – (IV), (D) – (II)

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Question: CUET 2026 PYQs

$\int \frac{x\,dx}{x^2+3x+2}$ **is equal to: (where c is an arbitrary constant)**

(A) $-\log|x+1| + 2\log|x+2| + c$

(B) $\log|x+1| - 2\log|x+2| + c$

(C) $-2\log|x+1| + 2\log|x+2| + c$

(D) $\log|x+1| + 2\log|x+2| + c$

$$I = \int \frac{x\,dx}{(x+1)(x+2)}$$

$$\frac{x}{(x+1)(x+2)} = \frac{A}{(x+1)} + \frac{B}{(x+2)}$$

$$x = A(x+2) + B(x+1)$$

$x=-2$ $\quad -2 = B(-2+1)$ $\quad B=2$

$x=-1$ $\quad -1 = A(-1+2)$ $\quad A=-1$

$$I = \int \frac{-1}{(x+1)} + \int \frac{2}{(x+2)}$$

$$I = -\log|x+1| + 2\log|x+2|$$

$$\Rightarrow \log\left|\frac{(x+2)^2}{(x+1)}\right|$$

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Question – CUET 2025 PYQs

#Q. $\int \frac{x}{(x-1)(x-2)}\,dx$ is equal to (where C is a constant of integration



A $\log_e \left|\frac{(x-1)^2}{x-2}\right| + C$

B $\log_e \left|\frac{(x-2)^2}{x-2}\right| + C$

C $\log_e|(x-2)(x-1)^2| + C$

D $\log_e \left|\frac{x-1}{(x-2)^2}\right| + C$

Question – CUET 2025 PYQs

#Q. $\int \frac{1}{(x+1)(x+2)}\,dx$ is equal to

$\Rightarrow \int \frac{(x+2)-(x+1)}{(x+1)(x+2)}\,dx = \int \frac{1}{(x+1)} - \frac{1}{(x+2)}\,dx$

A $\log_e \left|\frac{x+2}{x+1}\right| + C$: where C is an arbitrary constant

$\Rightarrow \log|x+1| - \log|x+2| + C$

B $\log_e \left|\frac{x+1}{x+2}\right| + C$: where C is an arbitrary constant

$\Rightarrow \log\left|\frac{x+1}{x+2}\right| + C$

C $\log_e |(x+1)(x+2)| + C$: where C is an arbitrary constant

D $\log_e |2x+3| + C$: where C is an arbitrary constant

$$\int \frac{\cos x}{(1+\sin x)(2+\sin x)}\,dx =$$

A $\log[(1+\sin x)(2+\sin x)] + c$

B $\log\frac{2+\sin x}{1+\sin x} + c$

C $\log\frac{1+\sin x}{2+\sin x} + c$

D None of these

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By Parts Method

$$\int u \cdot v\,dx \Rightarrow u \cdot \int v\,dx - \int \left(\frac{du}{dx} \cdot \int v\,dx\right) dx + C$$

1st Function

- I – Inverse
- L – Logarithm
- A – Algebraic
- T – Trigonometric
- E – Exponential

2nd Function – **We should take 2nd function which is easily integrable**

By- SSR Sir

8) (1) $I = \int x \log x \, dx$

IBP

$I = (\log x) \cdot \frac{x^2}{2} - \int \frac{1}{x} \cdot \frac{x^2}{2} dx$

IBP

$$I = \frac{x^2}{2}(\log x) - \frac{x^2}{4} + C$$

(11) $Q = I = \int e^x \cdot \sin x \, dx$ (2nd, IInd)

Original Ques^n → Repetition

$$I = (\sin x)\, e^x - \int \cos x \cdot e^x \, dx$$ (1st, IInd)

$$I = e^x \cdot \sin x - \left[\cos x \cdot e^x + \int \sin x \cdot e^x \, dx \right]$$

$$I = e^x \cdot \sin x - e^x \cdot \cos x - \int e^x \cdot \sin x \, dx$$

$$I = e^x \cdot \sin x - e^x \cos x - I$$

$$2I = e^x \cdot \sin x - e^x \cos x$$

$$\Rightarrow I = \frac{e^x}{2}(\sin x - \cos x) + C$$

Q) $\int e^x \cdot \cos x \, dx = ?$

Self Try.

$$\int e^x \cdot \sin x \, dx = \frac{e^x}{2}\left(\sin x - \cos x\right) + C$$

$$\int e^x \cdot \cos x \, dx = \frac{e^x}{2}\left(\sin x + \cos x\right) + C$$

(III) $I = \int (\log x)\, dx$ [2nd fun is missing]

$I = \int (\log x) \cdot 1 \, dx$

(1st: $\log x$; 2nd: 1)

$I = (\log x) \cdot x - \int \frac{1}{x} \cdot x \, dx$

$I = x(\log x) - x + C$

* $\int \log x \, dx = (x \log x - x) + C$

Integration by Cancellation

$$\int e^x [f(x) + f'(x)]\,dx = e^x f(x) + C$$

$$I = \int e^x \left[f(x) + f'(x) \right] dx$$

$$I = \int e^x \cdot f(x)\,dx + \int e^x \cdot f'(x)\,dx$$

I st II nd

$$I = f(x) \cdot e^x - \int f'(x) \cdot e^x\,dx + \int e^x \cdot f'(x)\,dx$$

$$I = e^x \cdot f(x) + C$$

By- SSR Sir

Question: CUET 2026 PYQs

Which of the following is/are correct?

A. $\int e^x \left[\frac{1}{(x-2)} - \frac{1}{(x-2)^2}\right] dx = \frac{e^x}{(x-2)} + C$, where C is an arbitrary constant.

B. $\int e^x \left[\frac{1}{(x-2)^3} - \frac{3}{(x-2)^4}\right] dx = \frac{e^x}{(x-2)^2} + C$, where C is an arbitrary constant.

C. $\int e^x \left[\frac{x-4}{(x-2)^3}\right] dx = \frac{e^x}{(x-2)^2} + C$, where C is an arbitrary constant.

D. $\int e^x \left[\frac{1}{x+2} - \frac{3}{(x+2)^2}\right] dx = \frac{e^x}{(x+2)^2} + C$, where C is an arbitrary constant.

Choose the correct answer from the options given below:

(A) A, B and D only

(B) A, C and D only

(C) B and C only

(D) A only

A, C

$\frac{1}{x^3} - \frac{-3}{x^4}$

$e^x \cdot \frac{1}{(x-y)^2}$

C) $\int e^x \left[\frac{x-2-2}{(x-2)^3}\right] dx \Rightarrow \int e^x \left[\frac{(x-2)}{(x-2)^3} - \frac{2}{(x-2)^3}\right]$

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Question: CUET 2026 PYQs

$\int \frac{(x-3)e^x}{(x-1)^3}\,dx$ **is equal to: (where C is an arbitrary constant)**

A. $\frac{1}{e^x(x-1)^2} + C$

B. $\frac{(x-1)^2}{e^x} + C$

C. $(x-1)^2 e^x + C$

D. $\frac{e^x}{(x-1)^2} + C$

$$\int e^x \left[\frac{x-3}{(x-1)^3}\right] dx$$

$$\Rightarrow \int e^x \left[\frac{(x-1)-2}{(x-1)^3}\right] dx$$

$$\Rightarrow \int e^x \left[\underbrace{\frac{1}{(x-1)^2}}_{f(x)} - \underbrace{\frac{2}{(x-1)^3}}_{f'(x)}\right] dx \Rightarrow e^x \cdot \frac{1}{(x-1)^2} + C$$

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Question: CUET 2026 PYQs

$\int \left\{ \frac{1}{\log x} - \frac{1}{(\log x)^2} \right\} dx$ **is equal to: (where C is an arbitrary constant)**

A. $\frac{1}{\log x} + C$

B. $\frac{x^2}{\log x} + C$

C. $\frac{x}{\log x} + C$

D. $\frac{1}{x \log x} + C$

$\log x = t$

$x = e^t$

$dx = e^t dt$

$I = \int e^t \left(\frac{1}{t} - \frac{1}{t^2} \right) dt \Rightarrow e^t \cdot \frac{1}{t} + C \Rightarrow e^{\log x} \cdot \frac{1}{(\log x)} + C$

$f(t)$ $f'(t)$

$\Rightarrow \frac{x}{(\log x)} + C$

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Question: CUET 2026 PYQs

$\int e^x(\sec x + \log_e(\sec x + \tan x))\,dx$ **is equal to: (where C is an arbitrary constant)**

f(x)

f'(x)

(A) $e^x \log_e(\tan x) + C$

(B) $e^x \log_e(\sec x) + C$

(C) $e^x \sec x + C$

(D) $e^x \log_e(\sec x + \tan x) + C$

$\int \sec x\,dx = \log|\sec x + \tan x|$

$\frac{d}{dx}(\log|\sec x + \tan x|) \Rightarrow \sec x$

$\Rightarrow e^x \log|\sec x + \tan x| + C$

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Question: CUET 2026 PYQs

$\int e^x \left(\frac{x-1}{2x^2}\right) dx$ **is equal to (where C is an arbitrary constant)**

A $\frac{e^x}{2x^2} + C$

B $-\frac{e^x}{2x^2} + C$

C $\frac{e^x}{2x} + C$

D $-\frac{e^x}{2x} + C$

$\Rightarrow \int \frac{1}{2} e^x \left[\frac{x}{x^2} - \frac{1}{x^2}\right] dx$

$\Rightarrow \frac{1}{2} \frac{e^x}{x} + c$

Question: CUET 2026 PYQs

If $f(x) = \int e^x(\tan x + \tan^2 x)\, dx$ **and** $f(0) = 0$**, then** $f\left(\frac{\pi}{4}\right)$ **equals:**

A. 0
B. -1
C. 1
D. $e^{\pi/4}$

$$f(x) = \int e^x \left[\tan x + (\sec^2 x - 1)\right] dx$$

$$\Rightarrow \int e^x \left[\underbrace{\tan x}_{f(x)} + \underbrace{\sec^2 x}_{f'(x)}\right] dx - \int e^x\, dx$$

$$f(x) = e^x \cdot \tan x - e^x + C$$

$\because f(0) = 0$

at $x = 0$, $f(0) = 0$

$x = 0$

$f(0) = e^0 \tan 0 - e^0 + C$

$0 = -1 + C$

$C = 1$

$f(x) = e^x \cdot \tan x - e^x + 1$

$f\left(\frac{\pi}{4}\right) = e^{\frac{\pi}{4}}\left[\tan\frac{\pi}{4} - 1\right] + 1 \Rightarrow 1$

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Question

$$\int e^x(\tan x + \log_e \sec x)dx =$$

$f(x)$ $\quad$ $f'(x)$

$\int f(\tan x) = \log|\sec x|$

$\frac{d}{dx}(\log \sec x) = \tan x$

A $e^x \log_e \sec x + C$

$\Rightarrow e^x \cdot \log(\sec x) + C$

B $\log_e \sec x + C$

C $e^x \tan x + C$

D $e^x \sec x + C$

SSR SIR

#Q. For $x \neq -1$, if $\int \frac{xe^x\,dx}{(1+x)^2} = \frac{ae^x}{(1+x)^b} + c$ where a, b are fixed numbers and c is the integration constant, then $a+b$ is equal to

A) 0

B) 1

C) 2

D) 3

$$\Rightarrow \int e^x \left[\frac{x+1-1}{(1+x)^2}\right] dx$$

$$\Rightarrow \int e^x \left[\frac{(x+1)}{(1+x)^2} - \frac{1}{(1+x)^2}\right] dx$$

$f(x)$ $\quad$ $f'(x)$

$$\Rightarrow \frac{e^x}{(1+x)} + C$$

$a=1$, $b=1$

Question

$$\int \left(\frac{1+x+x^2}{1+x^2}\right) e^{\tan^{-1}x} dx =$$

HW (11) $\int \frac{(1+x+x^2)}{(1+x^2)} e^{\cot^{-1}x} dx$

A $x + e^{\tan^{-1}x} + c$

B $e^{\tan^{-1}x} - x + c$

C $e^{\tan^{-1}x} + c$

D $xe^{\tan^{-1}x} + c$

$\tan^{-1}x = t$

$x = \tan t$

$dx = (\sec^2 t)\,dt$

$$I = \int e^t \cdot \left[\frac{1+\tan t+\tan^2 t}{1+\tan t}\right] \cdot \sec^2 t\, dt$$

$$I = \int e^t \left[\underbrace{\tan t}_{f(t)} + \underbrace{\sec^2 t}_{f'(t)}\right] dt$$

$I = e^t \cdot \tan t + C$

$I = e^{\tan^{-1}x} \cdot \tan[\tan^{-1}x] + C$

$I = x \cdot e^{\tan^{-1}x} + C$

Ans

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Question – CUET 2025 PYQs

#Q. $\int e^{-x}(\cot x + cosec^2 x)dx =$

$-x = t$

$dx = -dt \Rightarrow -\int e^{t}\left[\underbrace{-\cot t}_{f(t)} + \underbrace{cosec^2 t}_{f'(t)}\right]dt$

$\Rightarrow -e^{t}\cdot(-\cot t)$

$\Rightarrow e^{t}\cdot\cot t$

$\Rightarrow e^{-x}\cdot\cot(-x)$

$\Rightarrow -e^{-x}\cdot\cot x + c$

A $e^{-x}\cot x + c$, where c is an arbitrary constant.

B $-e^{-x}\cot x + c$, where c is an arbitrary constant.

C $-e^{-x}cosec^2 x + c$, where c is an arbitrary constant.

D $e^{-x}cosec^2 x + c$, where c is an arbitrary constant

SSR SIR

#Q. $\int e^{2x}\left(\sin x + \frac{1}{2}\cos x\right) dx$ is equal to

$2x = t$

$x = \frac{t}{2}$

$dx = \frac{1}{2}dt$

$I = \int e^t \cdot \left[\underbrace{\sin\frac{t}{2}}_{f(t)} + \frac{1}{2}\underbrace{\cos t/2}_{f'(t)}\right]\frac{1}{2}dt$

$\Rightarrow \frac{1}{2} \cdot e^t \cdot \sin(t/2)$

$\Rightarrow \frac{1}{2} e^{2x} \cdot \sin\left(\frac{2x}{2}\right)$

$\Rightarrow \frac{1}{2} e^{2x} \cdot \sin x + C$

A. $-\frac{1}{2}e^{2x}\cos x + C$, C is an arbitrary constant

B. $\frac{1}{2}e^{2x}\sin x + C$, C is an arbitrary constant

C. $e^{2x}\sin x + C$, C is an arbitrary constant

D. $-e^{2x}\cos x + C$, C is an arbitrary constant

Question – CUET 2025 PYQs

#Q. $\int \frac{\log_e x}{(1+\log_e x)^2} dx$ is equal to

$\log x = t$

$x = e^t$

$dx = e^t dt$

$I = \int e^t \left[\frac{(t+1)-1}{(1+t)^2}\right] dt$

A $\frac{1}{(1+\log_e x)^2} + C$, where C is constant of integration

B $\frac{x}{1+\log_e x} + C$, where C is constant of integration

C $\frac{x}{(1+\log_e x)^2} + C$, where C is constant of integration

D $\frac{1}{1+\log x} + C$, where C is constant of integration

$\Rightarrow \int e^t \left[\frac{(t+1)}{(1+t)^2} - \frac{1}{(1+t)^2}\right] dt$

$f(t)$ $f'(t)$

$\Rightarrow \frac{e^t}{(1+t)} + C \Rightarrow \frac{e^{\log x}}{(1+\log x)} + C$

$\Rightarrow \frac{x}{(1+\log x)} + C$

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Advance Substitution 1

$$\int \frac{1}{a\sin x + b\cos x + c}\,dx$$

↳ Trigo Degree : ZERO | ONE

Rule:

(I) $\sin x = \frac{2\tan x/2}{1+\tan^2 x/2}$ & $\cos x = \frac{1-\tan^2 x/2}{1+\tan^2 x/2}$

(II) $N^r \sim \sec^2(\,)$

$D^r \sim \tan(\,)$

(III) $\tan(\,) = t$

If $\int \frac{dx}{5+4\cos x} = \text{atan}^{-1}(b\tan\frac{x}{2}) + c$, then

a) $a = \frac{2}{3}, b = -\frac{1}{3}$

b) $a = \frac{2}{3}, b = \frac{1}{3}$

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

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

$$I = \int \frac{dx}{5 + 4\left(\frac{1-\tan^2 x/2}{1+\tan^2 x/2}\right)}$$

$$I = \int \frac{\sec^2 x/2}{9 + \tan^2 x/2}\, dx \Rightarrow \int \frac{2dt}{3^2+t^2} = \frac{2}{3}\tan^{-1}\left(t/3\right) + C$$

$\Rightarrow (2/3)\tan^{-1}\left[\frac{\tan x/2}{3}\right] + C$

$\tan x/2 = t$

$(\sec^2 x/2)\cdot\frac{1}{2}\, dx = dt$

$a = 2/3$

$b = 1/3$

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Advance Substitution 2

$$\int \frac{1}{a\sin^2 x + b\cos^2 x + c}\,dx$$

↳ Trigo Degree: 2 | ZERO

Rule:

(I) Divide by $\cos^2 x$ | $\sec^2 x$ In N^r & D^r both

(II)

$N^r \sim \sec^2 x$	$N^r \sim \operatorname{cosec}^2 x$
$D^r \sim \tan()$	$D^r \sim \cot()$

(III)

$\tan() = t$	$\cot() = t$

Question – CUET 2025 PYQs

#Q. $\int \frac{dx}{2\sin^2 x + 5\cos^2 x}$ is equal to

let $\tan x = t$

$(\sec^2 x)dx = dt$

$\Rightarrow \int \frac{\sec^2 x}{2\tan^2 x + 5}$ $\Rightarrow \int \frac{dt}{2t^2 + 5}$ $\Rightarrow \int \frac{dt}{(\sqrt{2}t)^2 + (\sqrt{5})^2}$

A $\frac{1}{\sqrt{10}}\tan^{-1}\left(\frac{\tan x}{\sqrt{5}}\right) + C$, C is an arbitrary constant

$\Rightarrow \frac{1}{\sqrt{2}\sqrt{5}}\tan^{-1}\left(\frac{\sqrt{2}t}{\sqrt{5}}\right) + C$

B $\frac{1}{\sqrt{5}}\tan^{-1}\left(\frac{2\tan x}{\sqrt{5}}\right) + C$, C is an arbitrary constant

$\Rightarrow \frac{1}{\sqrt{10}}\tan^{-1}\left(\sqrt{\frac{2}{5}}\tan x\right) + C$

C $\frac{1}{\sqrt{2}}\tan^{-1}\left(\frac{\sqrt{2}\tan x}{\sqrt{5}}\right) + C$, C is an arbitrary constant

D $\frac{1}{\sqrt{10}}\tan^{-1}\left(\frac{\sqrt{2}\tan x}{\sqrt{5}}\right) + C$, C is an arbitrary constant

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Question – CUET 2025 PYQs

#Q. For $x \in \left(0, \frac{\pi}{2}\right)$, $\int \frac{1}{\sin^2 x + \sin 2x}\, dx$ is equal to

$\Rightarrow \int \frac{dx}{\sin^2 x + 2\sin x \cos x} \Rightarrow \int \frac{\sec^2 x\, dx}{\tan^2 x + 2\tan x}$

$\tan x = t$

$\sec^2 x\, dx = dt$

$\Rightarrow \int \frac{dt}{t^2 + 2t}$

$\Rightarrow \int \frac{dt}{(t+1)^2 - 1}$

$\Rightarrow \frac{1}{2} \log \left| \frac{(t+1)-1}{(t+1)+1} \right| + C$

$\Rightarrow \frac{1}{2} \log \left| \frac{t}{t+2} \right| + C$

$\Rightarrow \frac{1}{2} \log \left| \frac{\tan x}{\tan x + 2} \right| + C$

A $\frac{1}{2}\log\left|\frac{\tan x+2}{\tan x-2}\right| + C$, where C is constant of integration

B $\frac{1}{2}\log\left|\frac{\tan x}{\tan x+2}\right| + C$, where C is constant of integration

C $\frac{1}{2}\log\left|\frac{\tan x+2}{\tan x}\right| + C$, where C is constant of integration

D $\frac{1}{2}\log\left|\frac{\tan x+1}{\tan x+2}\right| + C$, where C is constant of integration

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Question – CUET 2025 PYQs

$\tan x = t$

$(\sec^2 x)dx = dt$

#Q. $\int \frac{dx}{(1+5\sin^2 x)}$ is equal to

$\Rightarrow \int \frac{\sec^2 x}{\sec^2 x + 5\tan^2 x} \Rightarrow \int \frac{\sec^2 x}{1+6\tan^2 x} dx \Rightarrow \int \frac{dt}{1+(\sqrt{6}t)^2} \Rightarrow \frac{1}{\sqrt{6}} \tan^{-1}(\sqrt{6}t) + C$

$\Rightarrow \frac{1}{\sqrt{6}} \tan^{-1}(\sqrt{6}\tan x) + C$

A. $\sqrt{6}\cot^{-1}(\sqrt{6}\cot x) + C$; C is an arbitrary constant

B. $\sqrt{6}\cot^{-1}(\sqrt{6}\tan x) + C$; C is an arbitrary constant

C. $\frac{1}{\sqrt{6}}\tan^{-1}(\sqrt{6}\cot x) + C$; C is an arbitrary constant

D. $\frac{1}{\sqrt{6}}\tan^{-1}(\sqrt{6}\tan x) + C$; C is an arbitrary constant

$ab = 12 \quad -(1)$

$\frac{a}{b} = 3 \quad -(2)$

$a = 3b$

$(3b)\,b = 12$

$3b^2 = 12$

$b^2 = 4$

$b = \pm 2$

$a = \pm 6$

If $\int \frac{1}{a^2\sin^2 x + b^2\cos^2 x}\,dx = \frac{1}{12}\tan^{-1}(3\tan x) + \text{constant}$,

Then the maximum value of a sin x + b cos x, is:

A. √41

B. √39

C. √40

D. √42

$J = \int \frac{\sec^2 x}{a^2\tan^2 x + b^2}$

Let $\tan x = t$

$(\sec^2 x)\,dx = dt$

$I = \int \frac{dt}{(at)^2 + b^2}$

$I = \frac{1}{ab}\tan^{-1}\left(\frac{at}{b}\right) + C$

$I = \frac{1}{ab}\tan^{-1}\left[\frac{a}{b}\tan x\right] + C \Rightarrow \frac{1}{b}\tan^{-1}(3\tan x) + C$

$-\sqrt{a^2+b^2} \le a\sin x \pm b\cos x \le \sqrt{a^2+b^2}$

$\le \sqrt{3^2+4}$

$-\sqrt{40} \le$

$\le \sqrt{40}$

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Advance Substitution 3

$$2\sin x.\cos x = (\sin x + \cos x)^2 - 1$$

$$2\sin x.\cos x = 1 - (\sin x - \cos x)^2$$

1. $\frac{d(\sin x+\cos x)}{dx} = \cos x - \sin x$

2. $\frac{d(\sin x-\cos x)}{dx} = \cos x + \sin x$

$\sin 2x \rightarrow (\sin x+\cos x)^2 - 1$

$\sin 2x \rightarrow 1 - (\sin x-\cos x)^2$

$$I = \int \frac{(\sin x+\cos x)}{\sqrt{8-\sin 2x}}\,dx$$

$$I = \int \frac{(\sin x+\cos x)}{\sqrt{8-\{1-(\sin x-\cos x)^2\}}}\,dx$$

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Question – CUET 2025 PYQs

#Q. For $x \in \left(0, \frac{\pi}{2}\right)$, $\int \frac{\sin x + \cos x}{\sqrt{\sin 2x}}\, dx$, is equal to

Let $\sin x - \cos x = t$

$(\cos x + \sin x)\, dx = dt$

$\Rightarrow \int \frac{(\sin x + \cos x)\, dx}{\sqrt{1 - (\sin x - \cos x)^2}}$ $\Rightarrow \int \frac{dt}{\sqrt{1 - t^2}}$ $\Rightarrow \sin^{-1} t + C$

$\Rightarrow \sin^{-1}[\sin x - \cos x] + C$

A $\sin^{-1}(\sin 2x) + C$, C is an arbitrary constant

B $\sin^{-1}(\cos x - \sin x) + C$, C is an arbitrary constan

C $\sin^{-1}(\sin x - \cos x) + C$, C is an arbitrary constant

D $\sin^{-1}(\sin x + \cos x) + C$, C is an arbitrary constant

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Advance Substitution 4

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

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

1. $d\left(x+\frac{1}{x}\right)=\left(1-\frac{1}{x^2}\right)$
2. $d\left(x-\frac{1}{x}\right)=\left(1+\frac{1}{x^2}\right)$

$\left(x^2+\frac{1}{x^2}\right)$ → $\left(x+\frac{1}{x}\right)^2-2$, $\left(x-\frac{1}{x}\right)^2+2$

Q) $I=\int\frac{1-\frac{1}{x^2}}{\left(x^2+\frac{1}{x^2}\right)}dx$

$\Rightarrow\int\frac{1-\frac{1}{x^2}}{\left(x+\frac{1}{x}\right)^2-2}dx$

Let $x+\frac{1}{x}=t$

$\left(1-\frac{1}{x^2}\right)dx=dt$

$I=\int\frac{dt}{t^2-(\sqrt{2})^2}$

$I=\frac{1}{2\sqrt{2}}\ln\left|\frac{t-\sqrt{2}}{t+\sqrt{2}}\right|+C$

$t\to\left(x+\frac{1}{x}\right)$

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8) $I = \int \sqrt{\tan x}\, dx$

Let $\tan x = t^2 \Rightarrow t = \sqrt{\tan x}$

$(\sec^2 x)\, dx = 2t\, dt$

$dx = \dfrac{2t\, dt}{\sec^2 x}$

$dx = \dfrac{2t\, dt}{(1+\tan^2 x)}$

$dx = \dfrac{2t\, dt}{(1+t^4)}$

$I = \int \dfrac{2t^2}{(1+t^4)}\, dt$

$I = \int \dfrac{2}{\left(\frac{1}{t^2}+t^2\right)}\, dt$ {divide by t^2 Nr & Dr both}

$I = \int \dfrac{\left(1+\frac{1}{t^2}\right)+\left(1-\frac{1}{t^2}\right)}{\left(t^2+\frac{1}{t^2}\right)}\, dt$

$$J = \int \frac{1+\frac{1}{t^2}}{\left(t^2+\frac{1}{t^2}\right)}dt + \int \frac{1-\frac{1}{t^2}}{\left(t^2+\frac{1}{t^2}\right)}dt$$

$$J = \int \frac{\left(1+\frac{1}{t^2}\right)}{\left(t-\frac{1}{t}\right)^2+2}dt + \int \frac{\left(1-\frac{1}{t^2}\right)}{\left[t+\frac{1}{t}\right]^2-2}dt$$

$$\det\left(t-\frac{1}{t}\right)=u$$

$$\left(1+\frac{1}{t^2}\right)dt = du$$

$$\left(t+\frac{1}{t}\right)=v$$

$$\left(1-\frac{1}{t^2}\right)dt = dv$$

$$I = \int \frac{du}{u^2+(\sqrt{2})^2} + \int \frac{dv}{v^2-(\sqrt{2})^2}$$

$$I = \frac{1}{\sqrt{2}}\tan^{-1}\left[\frac{u}{\sqrt{2}}\right] + \frac{1}{2\sqrt{2}}\log\left|\frac{v-\sqrt{2}}{v+\sqrt{2}}\right| +$$

$$I = \frac{1}{\sqrt{2}} \tan^{-1}\left[\frac{t-\frac{1}{t}}{\sqrt{2}}\right] + \frac{1}{2\sqrt{2}} \log\left|\frac{t+\frac{1}{t}-\sqrt{2}}{t+\frac{1}{t}+\sqrt{2}}\right| + C$$

$$I = \frac{1}{\sqrt{2}} \tan^{-1}\left[\frac{t^2-1}{t\sqrt{2}}\right] + \frac{1}{2\sqrt{2}} \log\left|\frac{t^2-\sqrt{2}t+1}{t^2+\sqrt{2}t+1}\right| + C$$

$$I = \frac{1}{\sqrt{2}} \tan^{-1}\left[\frac{\tan x-1}{\sqrt{2\tan x}}\right] + \frac{1}{2\sqrt{2}} \log\left|\frac{\tan x-\sqrt{2\tan x}+1}{\tan x+\sqrt{2\tan x}+1}\right| + C$$

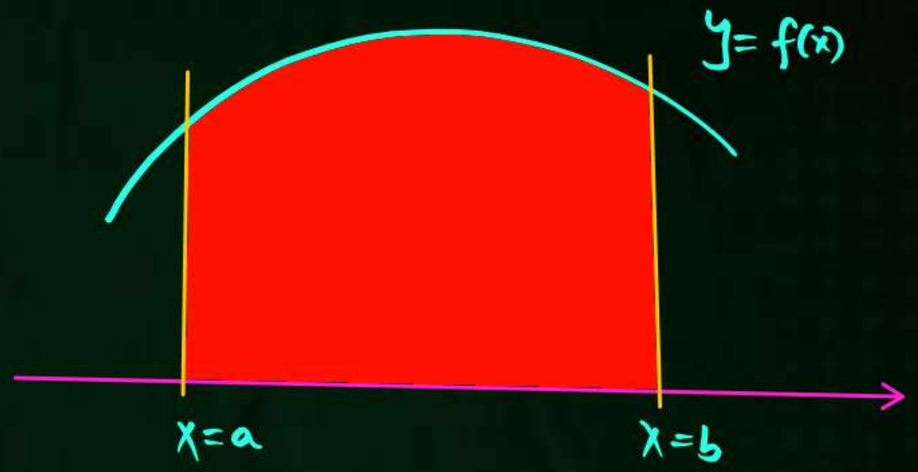
8)

$$I = \int \sqrt{\tan x} + \sqrt{\cot x} \; dx$$

1/10

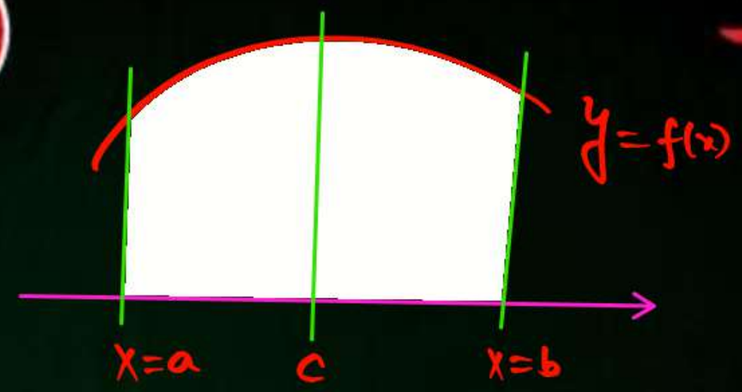
Definite Integral - Basic

$\int_a^b f(x)dx \Rightarrow$ Absolute Area Under The Curve of $y=f(x)$ from $x=a$ to $x=b$.



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Basic Properties of Definite Integral



(I) $$\int_a^b [f(x) \pm g(x)]dx = \int_a^b f(x)dx \pm \int_a^b g(x)dx$$

(II) $$\int_a^b kf(x)dx = k\int_a^b f(x)dx$$

(III) $$\int_a^a f(x)dx = 0$$

(IV) $$\int_a^b f(x)dx = -\int_b^a f(x)dx$$

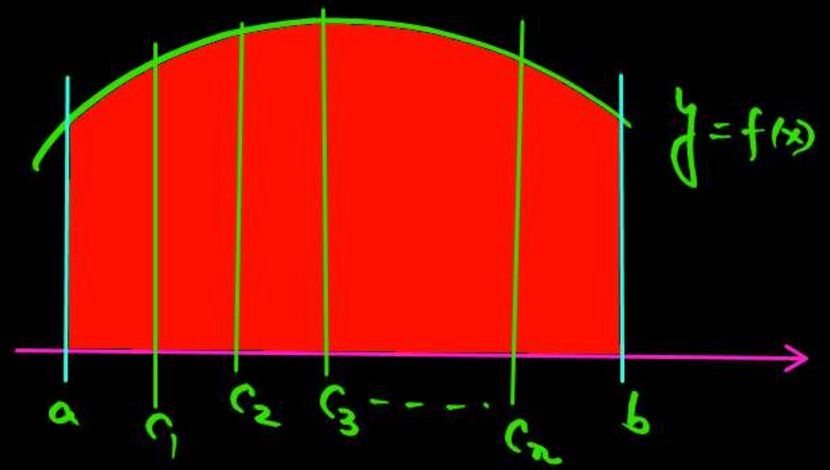
(V) $$\int_a^b f(x)dx = \int_a^b f(t)dt = \int_a^b f(u)du = \int_a^b f(v)dv$$

(VI) $$\int_a^b f(x)dx = \int_a^c f(x)dx + \int_c^b f(x)dx$$

$c \in [a,b]$

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$$\int_a^b f(x)dx = \int_a^{c_1} f(x)dx + \int_{c_1}^{c_2} f(x)dx + \cdots + \int_{c_n}^{b} f(x)dx$$





Methods of Definite Integral

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Definite Integral by Indefinite Rule

↳ (I) Solve The Integral by Indefinite Rule.

(II) (Upper − lower)

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Question: CUET 2026 PYQs

The value of $\displaystyle\int_{\pi/6}^{\pi/3} \frac{\sin x+\cos x}{\sqrt{\sin 2x}}\,dx$ **is:**

A. $\sin^{-1}\left(\frac{\sqrt{3}+1}{2}\right)$

B. $2\sin^{-1}\left(\frac{\sqrt{3}+1}{2}\right)$

C. $2\sin^{-1}\left(\frac{\sqrt{3}-1}{2}\right)$

D. $\sin^{-1}\left(\frac{\sqrt{3}-1}{2}\right)$

$$I=\int_{\pi/6}^{\pi/3}\frac{\sin x+\cos x}{\sqrt{1-(\sin x-\cos x)^2}}\,dx$$

Let $\sin x-\cos x=t$

$(\cos x+\sin x)\,dx=dt$

at $x=\pi/6 \Rightarrow t=\frac{1}{2}-\frac{\sqrt{3}}{2}\Rightarrow\frac{1-\sqrt{3}}{2}$

at $x=\pi/3 \Rightarrow t=\frac{\sqrt{3}}{2}-\frac{1}{2}=\frac{\sqrt{3}-1}{2}$

$$I=\int_{\frac{1-\sqrt{3}}{2}}^{\frac{\sqrt{3}-1}{2}}\frac{dt}{\sqrt{1-t^2}}\Rightarrow \sin^{-1}t \Rightarrow \sin^{-1}\left[\frac{\sqrt{3}-1}{2}\right]-\sin^{-1}\left(\frac{1-\sqrt{3}}{2}\right)$$

$$\Rightarrow 2\sin^{-1}\left(\frac{\sqrt{3}-1}{2}\right)$$

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Question: CUET 2026 PYQs

If $\int_{-1}^{b} x^3 \, dx = \frac{15}{4}$, then b can take the value

A 0

B 1

C 2

D 3



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Question: CUET 2026 PYQs

If $\int_0^1 (4x^3 + 3x^2 + 2x + k)dx = 0$, then the value of k is

A) 1

B) -1

C) 3

D) -3

$$\left(\frac{4x^4}{4} + \frac{3x^3}{3} + \frac{2x^2}{2} + kx\right)_0^1 = 0$$

$$(1+1+1+k) = 0$$

$$k = -3$$

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Question: CUET 2026 PYQs

$$\int_1^2 \frac{dx}{(x+1)(x+2)} = \int_1^2 \frac{(x+2)-(x+1)}{(x+1)(x+2)}dx$$

A. $\log_e 8 - \log_e 9$

B. $\log_e 9 - \log_e 8$

C. $\log_e 8 + \log_e 9$

D. $2\log_e 9 - \log_e 8$

$$\Rightarrow \int_1^2 \frac{1}{(x+1)} - \frac{1}{(x+2)}dx$$

$$\Rightarrow \log|x+1| - \log|x+2|$$

$$\Rightarrow \log\left|\frac{x+1}{x+2}\right|\Big|_1^2$$

$$\Rightarrow \log\left|\frac{3}{4}\right| - \log\left|\frac{2}{3}\right| \Rightarrow \log\left(\frac{3/4}{2/3}\right) \Rightarrow \log\left(\frac{9}{8}\right)$$

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Question: CUET 2026 PYQs

If $\int_0^4 \frac{dx}{\sqrt{x^2+2x+3}} = \log_e\left(\frac{\alpha+3\sqrt{\beta}}{1+\sqrt{\beta}}\right)$, $\beta > 0$, then $\alpha^2 + \beta^2$ is equal to

A. 40
B. 36
C. 34
D. 30

$$I = \int_0^4 \frac{dx}{\sqrt{(x+1)^2-1+3}}$$

$$I = \int_0^4 \frac{dx}{\sqrt{(x+1)^2+(\sqrt{2})^2}}$$

$16+8+3$

$$\Rightarrow \log\left|(x+1)+\sqrt{x^2+2x+3}\right|_0^4$$

$$\Rightarrow \log\left|5+3\sqrt{3}\right| - \log\left|1+\sqrt{3}\right|$$

$$\log\left|\frac{5+3\sqrt{3}}{1+\sqrt{3}}\right|$$

$\alpha = 5$, $\beta = 3$

$\alpha^2+\beta^2$

$\Rightarrow 25+9$

$\Rightarrow 34$

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Modulus &GIF Integral in Definite Integral

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Question – CUET 2025 PYQs

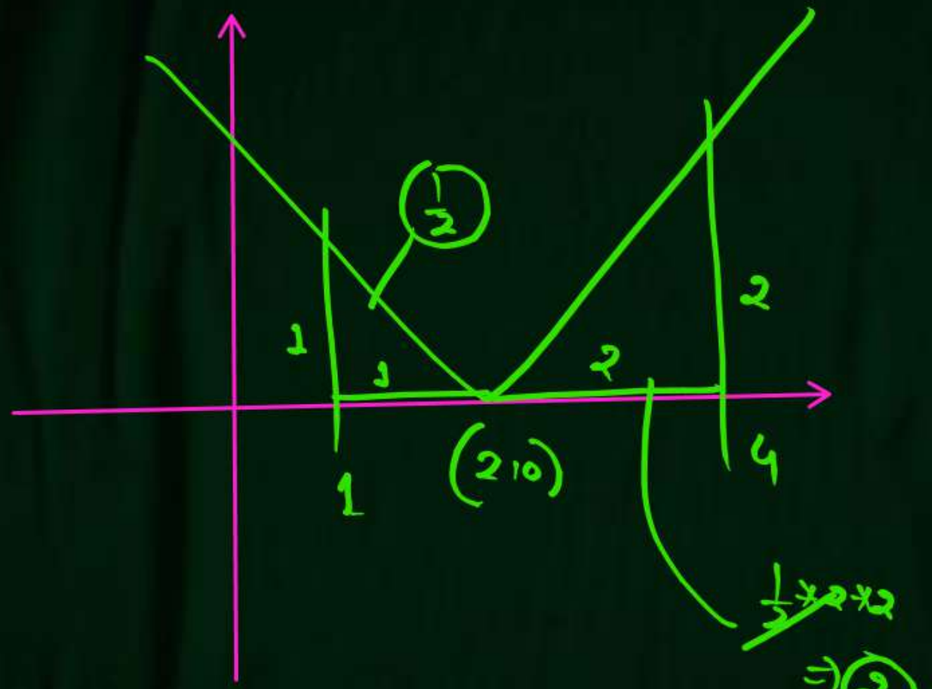
#Q. $\int_1^4 |x-2|\,dx$ is equal to:

A. 5

B. $\frac{7}{2}$

C. $\frac{3}{2}$

D. $\frac{5}{2}$ ✓



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Question – CUET 2025 PYQs

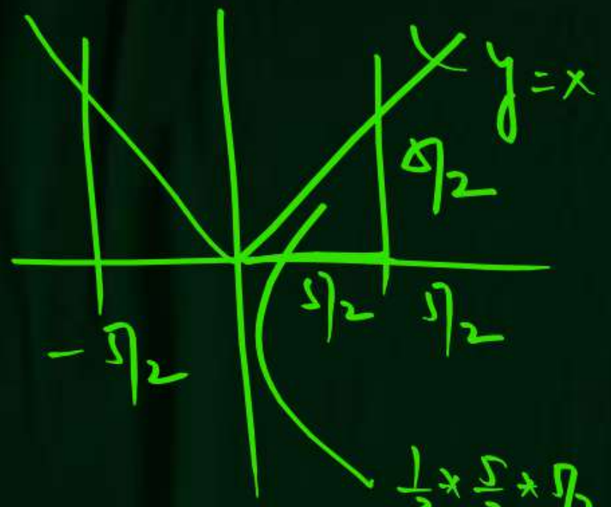
#Q. $\int_{-5/2}^{5/2} |x|\, dx$ is equal to:

A 25/4

B 0

C 5/2

D −5/2



$\Rightarrow \frac{25}{8} * 2 = \frac{25}{4}$

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CUET PYQs

Q. $\int_{-1}^{1}(|x-2|+|x|)\,dx =$

$y(0) = 2$

$y(1) = 2$

A 7

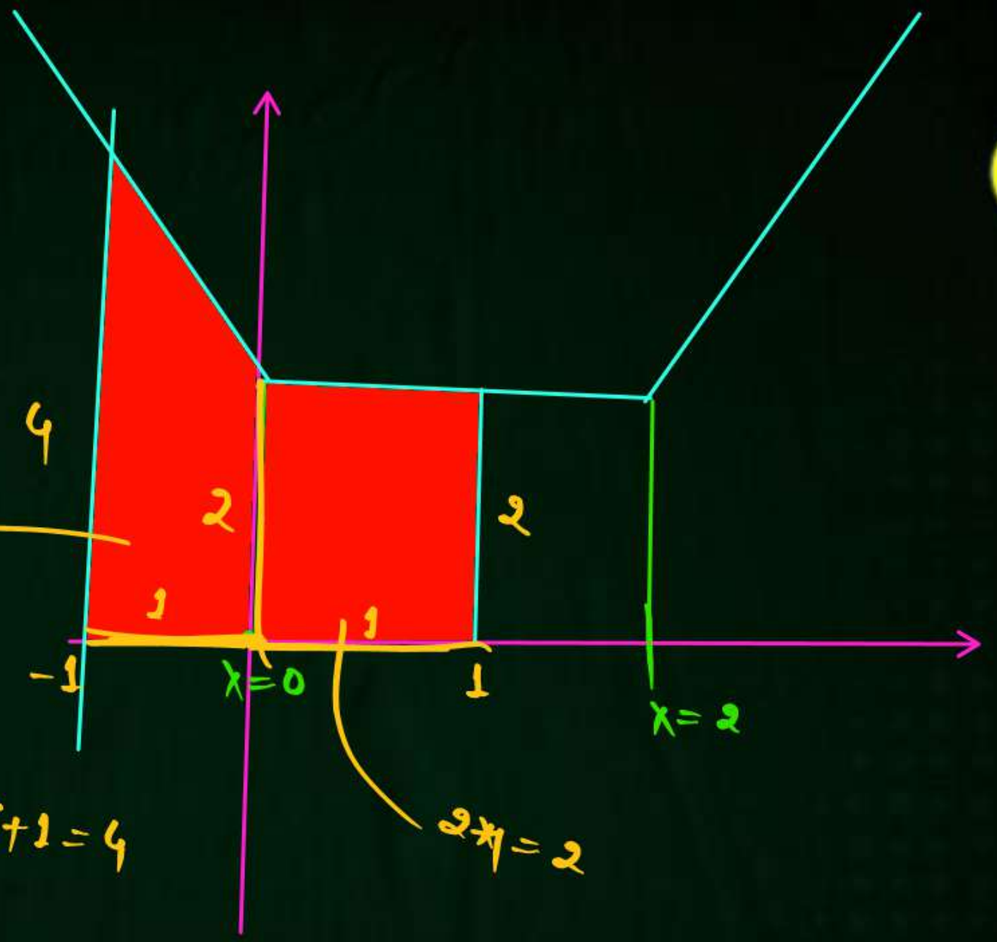
B 5

C 4

D 6

$\frac{1}{2} \times 6 \times 1$

$\Rightarrow (3)$

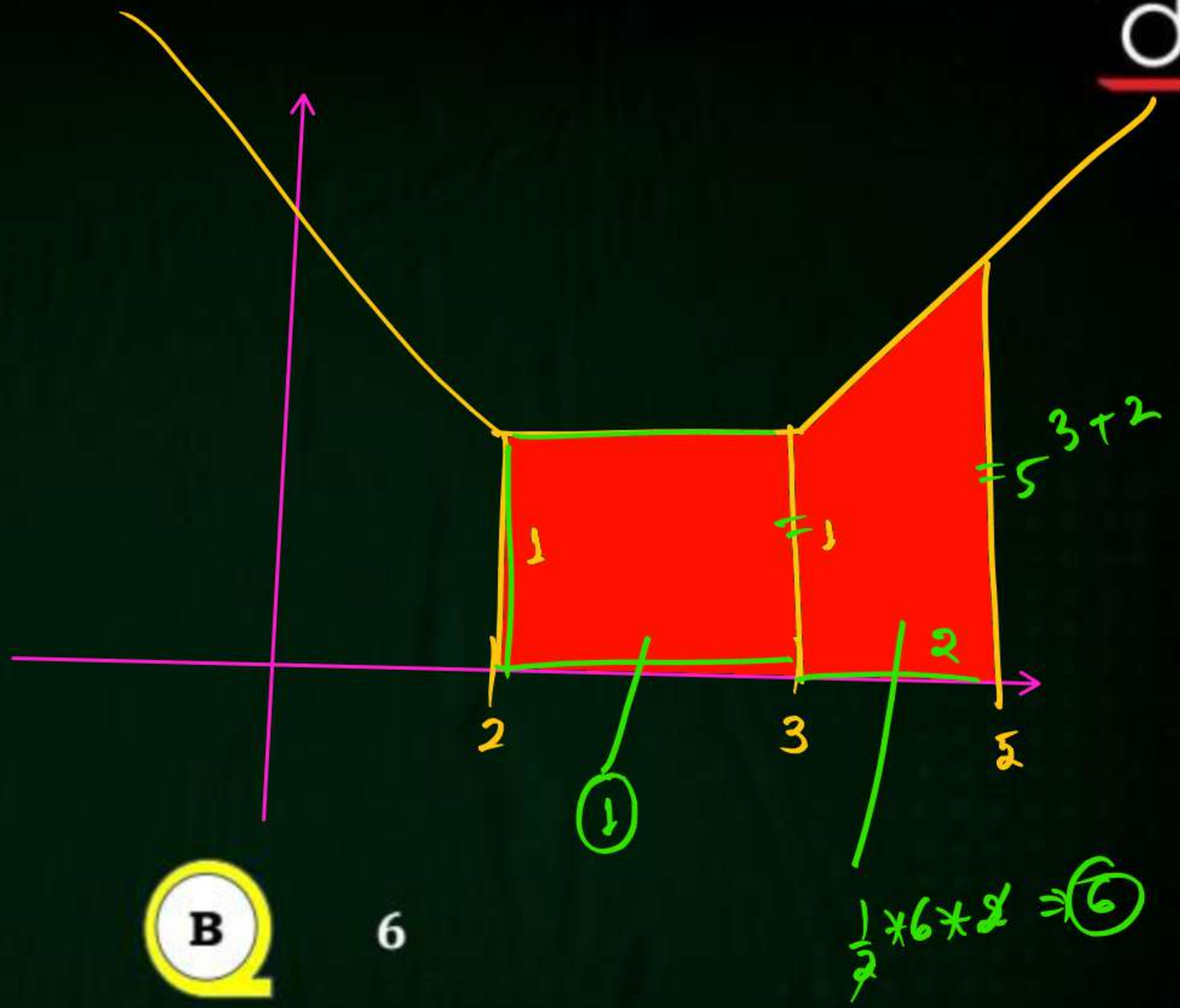


C

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CUET PYQs

Q. $\int_2^5 (|x-2| + |x-3|)dx =$



A. 7

B. 6

C. 5

D. 1

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Definite integral in by Parts Rule

$$\int_a^b u \cdot v\,dx \Rightarrow \left(u \cdot \int v\,dx\right)_a^b - \int_a^b \left(\frac{du}{dx} \cdot \int v\,dx\right) dx$$

By- SSR Sir

Question (2022-2025)

If $\int_0^1 \frac{e^x}{1+x}\,dx = K$, then $\int_0^1 \frac{e^x}{(1+x)^2}\,dx$ is equal to :

A $K - 1 + \frac{e}{2}$

B $K + 1 - \frac{e}{2}$

C $K - 1 - \frac{e}{2}$

D $K + 1 + \frac{e}{2}$

$$I = \int_0^1 e^x \underbrace{\frac{1}{(1+x)^2}}_{\text{IInd}}\,dx$$

I st

$$I = e^x\left[\frac{-1}{1+x}\right]\Big|_0^1 + \int_0^1 \frac{e^x}{(1+x)}\,dx$$

$$I = -\left[\frac{e}{2} - 1\right] + k \Rightarrow I = \left(k - \frac{e}{2} + 1\right)$$ Ans

SSR SIR



3 Important Properties of Definite Integral

(I) $$\int_a^b f(x)\,dx = \int_a^b f(a+b-x)\,dx$$ [King Property]

(II) $$\int_{-a}^{a} f(x)\,dx =$$ (Even & Odd Property)

(III) $$\int_0^{2a} f(x)\,dx =$$ (Limit ko Half karne ki Property)

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Property 1: King Property

$$\int_a^b f(x)\,dx = \int_a^b f(a+b-x)\,dx$$

$$I = \int_a^b f(x)\,dx \quad \checkmark \quad -(1)$$

$$x \to [(\text{upper limit} + \text{lower}) - x]$$

$$x \to [b+a-x]$$

$$I = \int_a^b f(b+a-x)\,dx \quad -(2)$$

Add (1)+(2)

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Question – CUET 2025 PYQs

#Q. $\int_0^2 x(2-x)^n dx$ is equal to

$$I = \int_0^2 x(2-x)^n dx \quad -(1)$$

$x \to (2+0-x)$

$x \to (2-x)$

$$I = \int_0^2 (2-x)x^n dx$$

$$I = \int_0^2 \left(2x^n - x^{n+1}\right) dx$$

$$I = \frac{2x^{n+1}}{(n+1)} - \frac{x^{n+2}}{(n+2)}\Big|_0^2$$

$$I = \frac{2^{n+2}}{(n+1)} - \frac{2^{n+2}}{(n+2)}$$

$$2^{n+2}\left[\frac{1}{(n+1)} - \frac{1}{(n+2)}\right]$$

$$\Rightarrow 2^{n+2}\left[\frac{(n+2)-(n+1)}{(n+1)(n+2)}\right]$$

$$\Rightarrow \frac{2^{n+2}}{(n+1)(n+2)}$$

(A) $\dfrac{2^{n+2}(n+1)}{(n+2)(n+3)}$

(B) $\dfrac{2^{n+2}(n+2)}{(n+1)(n+3)}$

(C) $\dfrac{2^{n+2}}{(n+1)(n+2)}$

(D) $\dfrac{2^{n+1}}{(n+1)(n+2)}$

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Question – CUET 2025 PYQs

#Q. value of $\int_2^3 \frac{\sqrt{x}}{\sqrt{x}+\sqrt{5-x}}\,dx$ is

$I = \frac{3-2}{2}$

$\Rightarrow \frac{1}{2}$

(5) $x+(5-x)=5$

$$I = \int_2^3 \frac{\sqrt{x}}{\sqrt{x}+\sqrt{5-x}}\,dx \quad -(1)$$

$x \to (5-x)$

$$I = \int_2^3 \frac{\sqrt{5-x}}{\sqrt{5-x}+\sqrt{x}}\,dx \quad -(2)$$

$$2I = \int_2^3 \frac{\sqrt{x}+\sqrt{5-x}}{\sqrt{x}+\sqrt{5-x}}\,dx$$

$$2I = \int_2^3 1\,dx$$

$$2I = x\Big|_2^3$$

$2I = (3-2)$

$I = 1/2$

A 0

B $\frac{1}{2}$

C 2

D π

SSR SIR

#Q. Value of $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \log(\tan x)dx$ is

A $\frac{\pi}{4}$

B $\frac{\pi}{12}$

C 0

D π

$$I = \int_{\pi/6}^{\pi/3} \log(\tan x)\,dx \quad — (1)$$

$$x \to \left(\frac{\pi}{3} + \frac{\pi}{6} - x\right)$$

$$x \to \left(\frac{\pi}{2} - x\right)$$

$$I = \int_{\pi/6}^{\pi/3} \log(\cot x)\,dx \quad — (2)$$

$$2I = \int_{\pi/6}^{\pi/3} \left(\log\tan x + \log\cot x\right)dx$$

$$2I = \int_{\pi/6}^{\pi/3} \log[\tan x \cdot \cot x]\,dx$$

$$2I = \int_{\pi/6}^{\pi/3} \log 1 \cdot dx$$

$$I = 0$$

Question – CUET 2025 PYQs

#Q. If $f(x)$ and $g(x)$ are continuous functions in $[0, a]$ such that $f(x) = f(a-x)$ and $g(x) + g(a-x) = a$ then $\int_0^a f(x)g(x)dx =$

A $a\int_0^a f(x)dx$

B $a\int_0^a g(x)dx$

C $\frac{a}{2}\int_0^a f(x)dx$

D $\frac{a}{2}\int_0^a g(x)dx$

$$I = \int_0^a f(x)\cdot g(x)\,dx \quad -(1)$$

$x \to (a-x)$

$$I = \int_0^a f(a-x)\cdot g(a-x)\,dx$$

$$I = \int_0^a f(x)\cdot[a-g(x)]\,dx$$

$$I = \int_0^a a\cdot f(x)\,dx - \underbrace{\int_0^a f(x)\cdot g(x)\,dx}_{I}$$

$$2I = \int_0^a a\cdot f(x)\,dx$$

$$\boxed{I = \frac{a}{2}\int_0^a f(x)\cdot dx}$$

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Question – CUET 2025 PYQs

#Q. The value of $\int_0^{\pi/2} \frac{\tan^7 x}{\cot^7 x + \tan^7 x} dx$ is

A $\pi/2$

B $\pi/3$

C $\pi/4$

D $\pi/6$

$\pi/2$
$\pi/2$

$\tan^7\left(\frac{\pi}{2} - x\right)$

$\frac{\frac{\pi}{2} - 0}{2} = \pi/4$

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Question – CUET 2025 PYQs

#Q. $\int_{-1}^{1} \frac{x^3+|x|+1}{x^2+2|x|+1} dx$ is equal to

A $\frac{1}{2}\log_e 2 - 1$

B $2\log_e 2$

C $1\log_e 2 - 2$

D $4\log_e 2$

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Property 2: Even/ODD Property

$$\int_{-a}^{a} f(x)\,dx =$$

If f(x): even

f(-x)=f(x)

Then $I = 2\int_{0}^{a} f(x)dx$

If f(x): ODD

f(-x)= - f(x)

Then $I = 0$

If f(x) is neither even nor odd

→ Use basic Rule

→ Or King Property

By:- SSR Sir

Question: CUET 2026 PYQs

The value of integral $\int_{-\pi/2}^{\pi/2} \frac{1}{1+e^{\sin x}}\,dx$ **is**

A. π

B. $\frac{\pi}{2}$

C. $\frac{\pi}{4}$

D. 2π

$$I = \int_{-\pi/2}^{\pi/2} \frac{1}{1+e^{\sin x}}\,dx \quad -(1)$$

$$x \to \left(\frac{\pi}{2} - \frac{\pi}{2} - x\right)$$

$$x \to (-x)$$

$$I = \int_{-\pi/2}^{\pi/2} \frac{1}{1+e^{-\sin x}}\,dx$$

$$I = \int_{-\pi/2}^{\pi/2} \frac{1}{1+\frac{1}{e^{\sin x}}}\,dx$$

$$I = \int_{-\pi/2}^{\pi/2} \frac{e^{\sin x}}{1+e^{\sin x}}\,dx \quad -(2)$$

$$2I = \int_{-\pi/2}^{\pi/2} \frac{1+e^{\sin x}}{1+e^{\sin x}}\,dx$$

$$2I = x\Big|_{-\pi/2}^{+\pi/2} \Rightarrow I = \frac{\pi}{2}$$

SSR SIR

Question: CUET 2026 PYQs

The value of $\int_{-\pi/3}^{\pi/3} \frac{1}{1+e^{\tan x}}\, dx$ **is:**

A $\pi/3$

B $-\pi/3$

C $\frac{2\pi}{3}$

D $\frac{\pi}{6}$

HW

Question: CUET 2026 PYQs | 2025

Value of $\int_{-1}^{1} \frac{x^5+|x|+1}{x^2+2|x|+1}\,dx$ **is equal to:**

A. 0

B. $\log_e 2$

C. $\log_e 4$

D. $\frac{1}{2}\log_e 2$

$$I = \int_{-1}^{1} \frac{x^5}{x^2+2|x|+1}\,dx + \int_{-1}^{1} \frac{|x|+1}{x^2+2|x|+1}\,dx$$

$$I = 2\int_{0}^{1} \frac{|x|+1}{x^2+2|x|+1}\,dx$$

$$I = 2\int_{0}^{1} \frac{(x+1)}{x^2+2x+1}\,dx \Rightarrow 2\int_{0}^{1} \frac{(x+1)}{(x+1)^2} \Rightarrow 2\log|x+1|\Big|_0^1$$

$$2\left[\log 2 - \log 1\right]^0$$

$$\Rightarrow 2\log 2$$

$$\Rightarrow \log 4$$

SSR SIR

Question – CUET 2025 PYQs

#Q. $\int_{-1}^{1}(x^7 + x^5 + x^3 + x + 1)dx$ is equal to

$\int_{-1}^{1} 1\,dx$

$\Rightarrow 2\Big|_{-1}^{1}$

$\Rightarrow 2$

A 0

B 1

C 2

D 4

SSR SIR

Question – CUET 2025 PYQs

#Q. The value of $\int_{-\pi/2}^{\pi/2}(x^5 + x^3\cos x)dx$ is

$\Rightarrow 0$

A 0

B -1

C π

D 1

SSR SIR

Question

The value of the integral $I = \int_{-1}^{1} (x + x^3 + x^5)dx$ is :

$\Rightarrow 0$

c

A 2

B −2

C 0

D 1

SSR SIR



Property 2: Power Half Property

$$\int_0^{2a} f(x)\,dx =$$

If f(2a-x) = f(x)

Then $I = 2\int_0^{a} f(x)\,dx$

If f(2a-x) = -f(x)

Then $I = 0$

If f(2a-x) is neither f(x) or -f(x)

→ Use basic Rule

→ Or King Property

Question – CUET 2025 PYQs

#Q. Match List-I with List-II

List-I	List-II
(A) $\int_{-a}^{a} f(x)dx = 0$	(I) 0
(B) $\int_{0}^{2a} f(x)dx = 2\int_{0}^{a} f(x)dx$	(II) 1
(C) $\int_{-\pi}^{\pi} \cos x\, dx$	(III) f is an odd function
(D) $\int_{-1}^{1} x^{101}dx + 1$	(IV) $f(2a - x) = f(x)$

Choose the correct answer from the options given below:

A (A)–(III), (B)–(IV), (C)–(I), (D)– (II)

B (A)–(III), (B)–(IV), (C)–(II), (D)–(1)

C (A)–(IV), (B)–(III), (C)–(II), (D)–(1)

D (A)–(IV), (B)–(III), (C)–(I), (D)–(II)

SSR SIR

Question

Match List I with List II

LIST I		LIST II	
A.	$\int_{-\pi}^{\pi} \sin^7 x dx$	I.	T
B.	$\int_{-\pi}^{\frac{\pi}{2}} (x\cos x + 1) dx$	II.	$\frac{\pi}{12}$
C.	$\int_{0}^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\sqrt{\sin x}+\sqrt{\cos x}} dx$	III.	0
D.	$\int_{1}^{\sqrt[3]{3}} \frac{dx}{1+x^2}$	IV.	$\frac{\pi}{4}$

A 1. A-II, B-III, C-IV, D-I

B A-III, B-I, C-IV, D-II

C A-I, B-II, C-III, D-IV

D A-IV, B-I, C-II, D-III

Choose the correct answer from the options given below :

SSR SIR

Question

Match List - I with List - II.

List – I	List - II
(A) $\int_{-\pi/2}^{\pi/2} \sin^5 x dx$	(I) π
(B) $\int_{-\pi/2}^{\pi/2} (x^3 + \tan^3 x + 1) dx$	(II) $\frac{\pi}{12}$
(C) $\int_0^{\pi/2} \frac{\cos^5 x}{\cos^5 x + \sin^5 x} dx$	(III) $\frac{\pi}{4}$
(D) $\int_1^{\sqrt{3}} \frac{dx}{1+x^2}$	(IV) 0

Choose the correct answer from the options given below :

A (A)-(IV), (B)-(I), (C)-(III), (D)-(II)

B (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

C (A)-(II), (B)-(III), (C)-(IV), (D)-(I)

D (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

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CUET PYQs

Q. $\int_0^{\pi} \frac{x}{1+|\cos x|}\,dx =$ ①

$$I = \int_0^{\pi} \frac{(\pi - x)}{1+|\cos x|}\,dx \quad - ②$$

$$2I = \int_0^{\pi} \frac{\pi}{1+|\cos x|}\,dx$$

$$I = \int_0^{\pi/2} \frac{\pi}{1+|\cos x|}$$

$$I = \pi \int_0^{\pi/2} \frac{1}{1+\cos x}$$

$I = \pi$

A. π

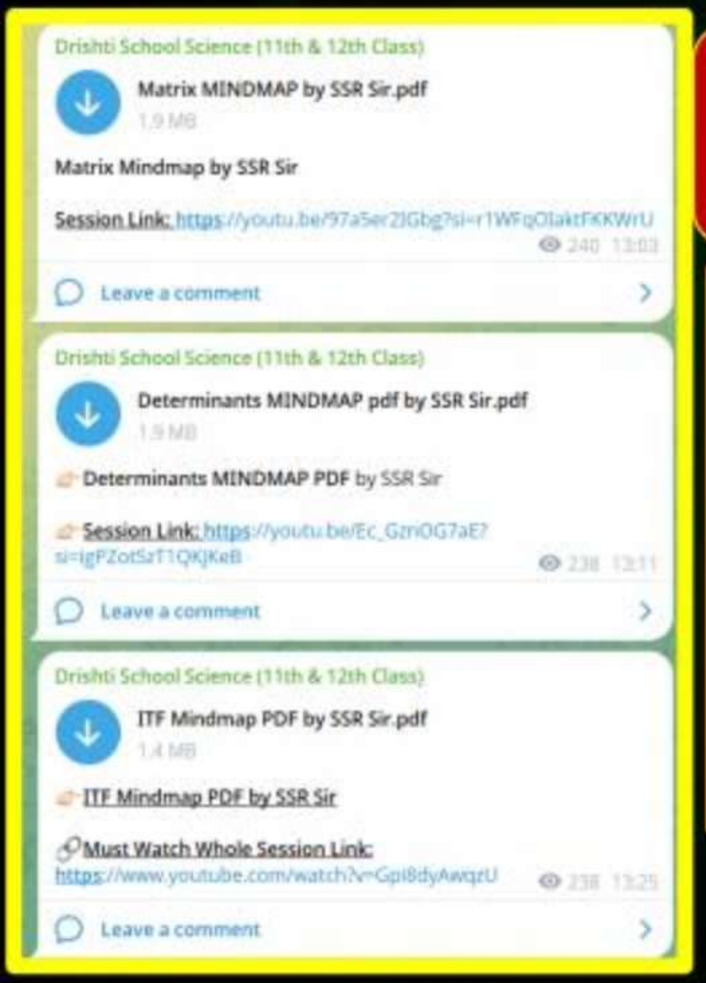
B. $\frac{\pi}{2}$

C. $\frac{3\pi}{4}$

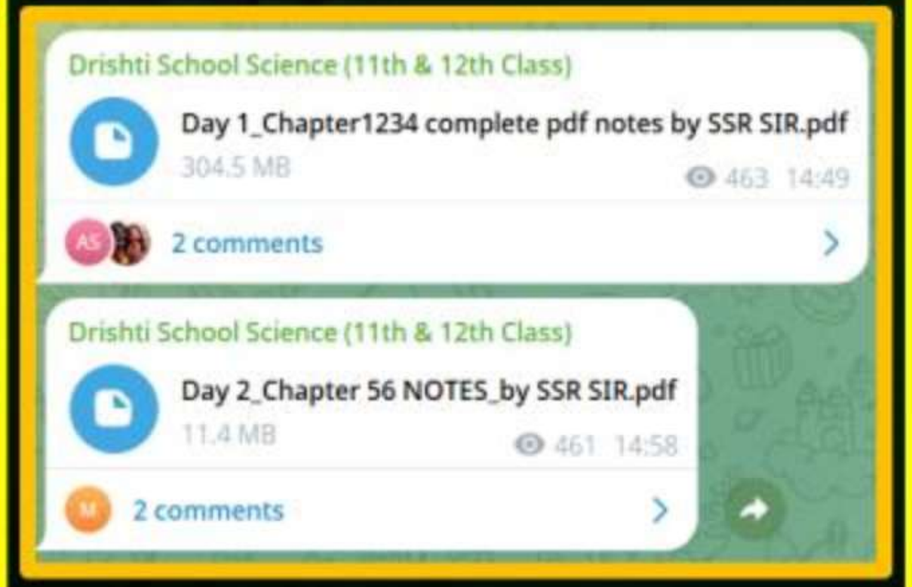
D. $\frac{5\pi}{6}$

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* CUET ⇒ Tuesday : Practice Session
8pm
+580 Q ⇒ Target
Thank
2022–26
3k
BPPT 5.0
BPPT 6.0
4.5K
50 – 45
You
May God Watch Over You !!
~ SHASHANK SINGH RAJPUT (SSR)