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1.
Integrate x sin x

Solution:
Let I = $\int x \sin x dx$
Taking x as first function and sin x as second function and integrating by parts, we obtain,

$$I = x\int \sin x dx - \int\left\{\left(\frac{d}{dx}x\right)\int \sin x\, dx\right\}dx$$

$$= x(-\cos x) - \int 1.(-\cos x)\,dx$$

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

Where C is an arbitrary constant.

2:
Integrate x sin 3x

Solution:
Let I = $\int x \sin 3x dx$
Taking x as first function and sin 3x as second function and integrating by parts, we obtain

$$I = x\int \sin 3x dx - \int\left\{\left(\frac{d}{dx}x\right)\int \sin 3x dx\right\}$$

$$= x\left(\frac{-\cos 3x}{3}\right) - \int 1.\left(\frac{-\cos 3x}{3}\right)dx$$

$$= \frac{-x\cos 3x}{3} + \frac{1}{3}\int \cos 3x dx$$

$$= \frac{-x\cos 3x}{3} + \frac{1}{9}\sin 3x + C$$

Where C is an arbitrary constant.

3:
Integrate $x^2 e^x$

Solution:
Let $I = \int x^2 e^x dx$
Taking x^2 as first function and ex as second function and integrating by parts, we obtain

$$I = x^2\int e^x dx - \int\left\{\left(\frac{d}{dx}x^2\right)\int e^x dx\right\}dx$$

$= x^2e^x - \int 2xe^x dx$

$= x^2e^x - 2\int x \cdot e^x dx$

Again integrating by parts, we obtain

$= x^2e^x - 2\left[x \cdot \int e^x dx - \int \left\{\left(\frac{d}{dx}x\right)\int e^x dx\right\}dx\right]$

$= x^2e^x - 2\left[xe^x - \int e^x dx\right]$

$= x^2e^x - 2\left[xe^x - e^x\right]$

$= x^2e^x - 2xe^x + 2e^x + C$

$= e^x\left(x^2 - 2x + 2\right) + C$

Where C is an arbitrary constant.

4.

Integrate x log x

Solution:

Let $I = \int x \log x dx$

Taking log x as first function and x as second function and integrating by parts, we obtain

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

$= \log x . \frac{x^2}{2} - \int \frac{1}{x} . \frac{x^2}{2} dx$

$= \frac{x^2 \log x}{2} - \int \frac{x}{2} dx$

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

Where C is an arbitrary constant.

5.

Integrate *x* log 2x

Solution:

Let $I = \int x \log 2x dx$

Taking log 2x as first function and x as second function and integrating by parts, we obtain

$I = \log 2x \int x\, dx - \int \left\{\left(\frac{d}{dx}\log 2x\right)\int x\, dx\right\}dx$

$= \log 2x . \frac{x^2}{2} - \int \frac{2}{2x} . \frac{x^2}{2} dx$

$$= \frac{x^2 \log 2x}{2} - \int \frac{x}{2} dx$$

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

Where C is an arbitrary constant.

6.

Integrate $x^2 \log x$

Solution:

Let $I = \int x^2 \log x dx$

Taking log x as first function and x^2 as second function and integrating by parts, we obtain

$$I = \log x \int x^2 dx - \int \left\{ \left(\frac{d}{dx} \log x \right) \int x^2 dx \right\} dx$$

$$= \log x . \left(\frac{x^3}{3} \right) - \int \frac{1}{x} . \frac{x^3}{3} dx$$

$$= \frac{x^3 \log x}{3} - \int \frac{x^2}{3} dx$$

$$= \frac{x^3 \log x}{3} - \frac{x^3}{9} + C$$

Where C is an arbitrary constant.

7.

Integrate $x \sin^{-1} x$

Solution:

Let $I = \int x \sin^{-1} x dx$

Taking $\sin^{-1}$ x as first function and x as second function and integrating by parts, we obtain

$$I = \sin^{-1} x \int x\, dx - \int \left\{ \left(\frac{d}{dx} \sin^{-1} x \right) \int x\, dx \right\} dx$$

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

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

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

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

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

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

$$=\frac{x^2\sin^{-1}x}{2}+\frac{x}{4}\sqrt{1-x^2}+\frac{1}{4}\sin^{-1}x-\frac{1}{2}\sin^{-1}x+C$$

$$\frac{1}{4}(2x^2-1)\sin^{-1}x+\frac{x}{4}\sqrt{1-x^2}+C$$

Where C is an arbitrary constant.

8.

Integrate $x\tan^{-1}x$

Solution:

Let $I=\int x\tan^{-1}x\,dx$

Taking $\tan^{-1}x$ as first function and x as second function and integrating by parts, we obtain

$$I=\tan^{-1}x\int x\,dx-\int\left\{\left(\frac{d}{dx}\tan^{-1}x\right)\int x\,dx\right\}dx$$

$$=\tan^{-1}x\left(\frac{x^2}{2}\right)-\int\frac{1}{1+x^2}.\frac{x^2}{2}dx$$

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

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

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

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

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

Where C is an arbitrary constant.

9.

Integrate $x\cos^{-1}x$

Solution:

Let $I=\int x\cos^{-1}xdx$

Taking $\cos^{-1}$ x as first function and x as second function and integrating by parts, we obtain

$$I=\cos^{-1}x\int xdx-\int\left\{\left(\frac{d}{dx}\cos^{-1}x\right)\int xdx\right\}dx$$

$$=\cos^{-1}x\frac{x^2}{2}-\int\frac{-1}{\sqrt{1-x^2}}.\frac{x^2}{2}dx$$

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

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

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

$$=\frac{x^2\cos^{-1}x}{2}-\frac{1}{2}\left(\frac{x}{2}\sqrt{1-x^2}\right)-\frac{1}{4}\cos^{-1}x+C$$

Where C is an arbitrary constant.

10.

Integrate $\left(\sin^{-1}x\right)^2$

Solution:

Let $I=\int\left(\sin^{-1}x\right)^2.1dx$

Taking $(\sin^{-1}x)^2$ as first function and 1 as second function and integrating by parts, we obtain

$$I=\int\left(\sin^{-1}x\right).\int 1dx-\int\left\{\frac{d}{dx}\left(\sin^{-1}x\right)^2.\int 1.dx\right\}dx$$

$$=\left(\sin^{-1}x\right)^2.x-\int\frac{2\sin^{-1}x}{\sqrt{1-x^2}}.xdx$$

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

$$=x\left(\sin^{-1}x\right)^2+\left[\sin^{-1}x\int\frac{-2x}{\sqrt{1-x^2}}dx-\int\left\{\left(\frac{d}{dx}\sin^{-1}x\right)\int\frac{-2x}{\sqrt{1-x^2}}dx\right\}dx\right]$$

$$=x\left(\sin^{-1}x\right)^2+\left[\sin^{-1}x.2\sqrt{1-x^2}-\int\frac{1}{\sqrt{1-x^2}}.2\sqrt{1-x^2}dx\right]$$

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

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

Where C is an arbitrary constant.

11.

Integrate $\frac{x\cos^{-1}x}{\sqrt{1-x^2}}$

Solution:

Let $I=\int\frac{x\cos^{-1}x}{\sqrt{1-x^2}}dx$

$$I=\frac{-1}{2}\int\frac{-2x}{\sqrt{1-x^2}}.\cos^{-1}xdx$$

Taking $\cos^{-1}$ x as first function and $\left(\frac{-2x}{\sqrt{1-x^2}}\right)$ as second function and integrating by parts, we obtain

$$I=\frac{-1}{2}\left[\cos^{-1}x\int\frac{-2x}{\sqrt{1-x^2}}dx-\int\left\{\left(\frac{d}{dx}\cos^{-1}x\right)\int\frac{-2x}{\sqrt{1-x^2}}dx\right\}dx\right]$$

$$=\frac{-1}{2}\left[\cos^{-1}x.2\sqrt{1-x^2}-\int\frac{-1}{\sqrt{1-x^2}}.2\sqrt{1-x^2}dx\right]$$

$$=\frac{-1}{2}\left[2\sqrt{1-x^2}\cos^{-1}x+\int 2dx\right]$$

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

$$=-\left[\sqrt{1-x^2}\cos^{-1}x+x\right]+C$$

Where C is an arbitrary constant.

12.

Integrate $x\sec^2 x$

Solution:

Let $I=\int x\sec^2 xdx$

Taking x as first function and $\sec^2$ x as second function and integrating by parts, we obtain

$$I=x\int\sec^2 xdx-\int\left\{\left\{\frac{d}{dx}x\right\}\int\sec^2 xdx\right\}dx$$

$$=x\tan x-\int 1.\tan xdx$$

$$=x\tan x+\log|\cos x|+C$$

Where C is an arbitrary constant.

13.

Integrate $\tan^{-1} x$

Solution:

Let $I = \int 1.\tan^{-1} x dx$

Taking $\tan^{-1}$ x as first function and 1 as second function and integrating by parts, we obtain

$$I = \tan^{-1} x \int 1 dx - \int \left\{ \left(\frac{d}{dx} \tan^{-1} x \right) \int 1.dx \right\} dx$$

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

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

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

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

Where C is an arbitrary constant.

14.

Integrate $x(\log x)^2 dx$

Solution:

$$I = \int x(\log x)^2 dx$$

Taking $(\log x)^2$ as first function and 1 as second function and integrating by parts, we obtain

$$I = (\log)^2 \int xdx - \int \left[\left\{ \left(\frac{d}{dx} \log x \right)^2 \right\} \int xdx \right] dx$$

$$= \frac{x^2}{2}(\log x)^2 - \left[\int 2\log x.\frac{1}{x}.\frac{x^2}{2} dx \right]$$

$$= \frac{x^2}{2}(\log x)^2 - \int x\log xdx$$

Again integrating by parts, we obtain

$$I = \frac{x^2}{2}(\log x)^2 - \left[\log x \int xdx - \int \left\{ \left(\frac{d}{dx} \log x \right) \int xdx \right\} dx \right]$$

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

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

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

Where C is an arbitrary constant.

15.

Integrate $\left(x^2+1\right)\log x$

Solution:

Let $I=\int\left(x^2+1\right)\log xdx=\int x^2\log xdx+\int\log xdx$

Let I = I_1 + I_2 … (1)

Where, $I_1=\int x^2\log xdx$ and $I_2=\int\log xdx$

$I_1=\int x^2\log xdx$

Taking log x as first function and x^2 as second function and integrating by parts, we obtain

$I_1=\log x\int x^2\,dx-\int\left\{\left(\frac{d}{dx}\log x\right)\int x^2\,dx\right\}dx$

$=\log x.\frac{x^3}{3}-\int\frac{1}{x}.\frac{x^3}{3}dx$

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

$=\frac{x^3}{3}\log x-\frac{x^3}{9}+C_1 \qquad ...(2)$

$I_2=\int\log xdx$

Taking log x as first function and 1 as second function and integrating by parts, we obtain

$I_2=\log x\int 1.dx-\int\left\{\left(\frac{d}{dx}\log x\right)\int 1.dx\right\}$

$=\log x.x-\int\frac{1}{x}.xdx$

$=x\log x-\int 1dx$

$=x\log x-x+C_2 \qquad ...(3)$

Using equations (2) and (3) in (1), we obtain

$I=\frac{x^3}{3}\log x-\frac{x^3}{9}+C_1+x\log x-x+C_2$

$=\frac{x^3}{3}\log x-\frac{x^3}{9}+x\log x-x+\left(C_1+C_2\right)$

$=\left(\frac{x^3}{3}+x\right)\log x-\frac{x^3}{9}-x+C$

Where C is an arbitrary constant.

16.

Integrate $e^x(\sin x+\cos x)$

Solution:

Let $I=\int e^x(\sin x+\cos x)dx$

Let f (x) = sin x

$f'(x)=\cos x$

$I=\int e^x\{f(x)+f'(x)\}dx$

It is known that, $\int e^x\{f(x)+f'(x)\}dx=e^x f(x)+C$

$\therefore I=e^x\sin x+C$

Where C is an arbitrary constant.

17.

Integrate $\dfrac{xe^x}{(1+x)^2}$

Solution:

Let $I=\int\frac{xe^x}{(1+x)^2}dx=\int e^x\left\{\frac{x}{(1+x)^2}\right\}dx$

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

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

Let $f(x)=\frac{1}{1+x}$ $\qquad f'(x)=\frac{-1}{(1+x)^2}$

$\Rightarrow\int\frac{xe^x}{(1+x)^2}dx=\int e^x\{f(x)+f'(x)\}dx$

It is known that, $\int e^x\{f(x)+f'(x)\}dx=e^x f(x)+C$

$\therefore\int\frac{xe^x}{(1+x)^2}dx=\frac{e^x}{1+x}+C$

Where C is an arbitrary constant.

18.

Integrate $e^x\left(\dfrac{1+\sin x}{1+\cos x}\right)$

Solution:

$$e^x\left(\frac{1+\sin x}{1+\cos x}\right)$$

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

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

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

$$=\frac{1}{2}e^x\left[\tan\frac{x}{2}+1\right]^2$$

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

$$=\frac{1}{2}e^x\left[1+\tan^2\frac{x}{2}+2\tan\frac{x}{2}\right]$$

$$=\frac{1}{2}e^x\left[\sec^2\frac{x}{2}+2\tan\frac{x}{2}\right]$$

$$\frac{e^x(1+\sin x)dx}{(1+\cos x)}=e^x\left[\frac{1}{2}\sec^2\frac{x}{2}+\tan\frac{x}{2}\right] \qquad ...(1)$$

Let $\tan\frac{x}{2}=f(x)$ so $f'(x)=\frac{1}{2}\sec^2\frac{x}{2}$

It is known that, $\int e^x\{f(x)+f'(x)\}dx=e^x f(x)+C$

From equation (1), we obtain

$$\int\frac{e^x(1+\sin x)}{(1+\cos x)}dx=e^x\tan\frac{x}{2}+C$$

Where C is an arbitrary constant.

19:

Integrate $e^x\left(\frac{1}{x}-\frac{1}{x^2}\right)$

Solution:

Let $I=\int e^x\left[\frac{1}{x}-\frac{1}{x^2}\right]dx$

Also, let $\frac{1}{x}=f(x)$ $\qquad f'(x)=\frac{-1}{x^2}$

It is known that, $\int e^x\{f(x)+f'(x)\}dx=e^x f(x)+C$

$\therefore I=\frac{e^x}{x}+C$

Where C is an arbitrary constant.

20:

Integrate $\frac{(x-3)e^x}{(x-1)^3}$

Solution:

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

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

Let $f(x)=\frac{1}{(x-1)^2}$ $\qquad f'(x)=\frac{-2}{(x-1)^3}$

It is known that, $\int e^x\{f(x)+f'(x)\}dx=e^x f(x)+C$

$\therefore\int e^x\left\{\frac{(x-3)}{(x-1)^2}\right\}dx=\frac{e^x}{(x-1)^2}+C$

Where C is an arbitrary constant.

21:

Integrate $e^{2x}\sin x$

Solution:

Let $I=\int e^{2x}\sin x dx$ $\qquad ...(1)$

Integrating by parts, we obtain

$I=\sin x\int e^{2x}dx-\int\left\{\left(\frac{d}{dx}\sin x\right)\int e^{2x}dx\right\}dx$

$\Rightarrow I=\sin x.\frac{e^{2x}}{2}-\int\cos x.\frac{e^{2x}}{2}dx$

$$\Rightarrow I=\frac{e^{2x}\sin x}{2}-\frac{1}{2}\int e^{2x}\cos x dx$$

Again integrating by parts, we obtain

$$I=\frac{e^{2x}\sin x}{2}-\frac{1}{2}\left[\cos x\int e^{2x}dx-\int\left\{\left(\frac{d}{dx}\cos x\right)\int e^{2x}dx\right\}dx\right]$$

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

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

$$\Rightarrow I=\frac{e^{2x}\sin x}{2}-\frac{e^{2x}\cos x}{4}-\frac{1}{4}I \qquad [\text{From (1)}]$$

$$\Rightarrow I+\frac{1}{4}I=\frac{e^{2x}\sin x}{2}-\frac{e^{2x}\cos x}{4}$$

$$\Rightarrow \frac{5}{4}I=\frac{e^{2x}\sin x}{2}-\frac{e^{2x}\cos x}{4}$$

$$\Rightarrow I=\frac{4}{5}\left[\frac{e^{2x}\sin x}{2}-\frac{e^{2x}\cos x}{4}\right]+C$$

$$\Rightarrow I=\frac{e^{2x}}{5}[2\sin x-\cos x]+C$$

Where C is an arbitrary constant.

22:

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

Solution:

Let $x=\tan\theta \qquad dx=\sec^2\theta d\theta$

$$\therefore \sin^{-1}\left(\frac{2x}{1+x^2}\right)=\sin^{-1}\left(\frac{2\tan\theta}{1+\tan^2\theta}\right)=\sin^{-1}(\sin 2\theta)=2\theta$$

$$\int\sin^{-1}\left(\frac{2x}{1+x^2}\right)dx=\int 2\theta.\sec^2\theta d\theta=2\int\theta.\sec^2\theta d\theta$$

Integrating by parts, we obtain

$$2\left[\theta.\int\sec^2\theta d\theta-\int\left\{\left(\frac{d}{d\theta}\theta\right)\int\sec^2\theta d\theta\right\}d\theta\right]$$

$$=2\left[\theta.\tan\theta-\int\tan\theta d\theta\right]$$

$$=2\left[\theta\tan\theta+\log|\cos\theta|\right]+C$$

$$=2\left[x\tan^{-1}x+\log\left|\frac{1}{\sqrt{1+x^2}}\right|\right]+C$$

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

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

Where C is an arbitrary constant.

Chose the correct answer in Exercises 23 and 24.

23.

$\int x^2 e^{x^3} dx$ equals

(A) $\frac{1}{3}e^{x^3}+C$ (B) $\frac{1}{3}e^{x^2}+C$

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

Solution:

Let $I=\int x^2 e^{x^3} dx$

Also, let $x^3=t$ so $3x^2dx=dt$

$$\Rightarrow I=\frac{1}{3}\int e^t dt$$

$$=\frac{1}{3}\left(e^t\right)+C$$

$$=\frac{1}{3}e^{x^3}+C$$

Hence, the correct Answer is A.

24.

$\int e^x \sec x(1+\tan x)dx$ equals

(A) $e^x\cos x+C$ (B) $e^x\sec x+C$

(C) $e^x\sin x+C$ (D) $e^x\tan x+C$

Solution:

$$\int e^x\sec x(1+\tan x)dx$$

Let $I=\int e^x\sec x(1+\tan x)dx=\int e^x(\sec x+\sec x\tan x)dx$

Also, let $\sec x=f(x)$ $\sec x\tan x=f'(x)$

It is known that, $\int e^x\left\{f(x)+f'(x)\right\}dx=e^x f(x)+C$

$$\therefore I=e^x\sec x+C$$

Hence, the correct Answer is B.