

Indefinite Integrals Ex 19.26 Q5

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

Integrating by parts

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

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

$$= \frac{e^x}{2x} + c$$

Indefinite Integrals Ex 19.26 Q6

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

$$= \int e^x \sec x dx + \int e^x \sec x \tan x dx$$

Integrating by parts

$$= e^{x} \sec x - \int e^{x} \left(\frac{d}{dx} \sec x\right) dx + \int e^{x} \sec x \tan x dx$$

$$= e^{x} \sec x - \int e^{x} \sec x \tan x dx + \int e^{x} \sec x \tan x dx$$

$$= e^{x} \sec x + c$$

$$\therefore \int e^x \sec x (1 + \tan x) dx = e^x \sec x + c$$
Indefinite Integrals Ex 19.26 Q7

Let 
$$I = \int e^x (\tan x - \log \cos x) dx$$
  
=  $\int e^x \tan x dx - \int e^x \log \cos x dx$ 

Integrating by parts

$$= \int e^{x} \tan x dx - \left\{ e^{x} \log \cos x - \int e^{x} \left( \frac{d}{dx} \log \cos x \right) dx \right\}$$

$$= \int e^{x} \tan x dx - \left\{ e^{x} \log \cos x + \int e^{x} \tan x dx \right\}$$

$$= \int e^{x} \tan x dx - e^{x} \log \cos x - \int e^{x} \tan x dx + c$$

$$= -e^{x} \log \cos x + c$$

$$= e^{x} \log \sec x + c \qquad [\because \log \sec x = -\log \cos x]$$

Indefinite Integrals Ex 19.26 Q8

Let 
$$I = \int e^x \left[ \sec x + \log \left( \sec x + \tan x \right) \right] dx$$

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

Integrating by parts

$$= \int e^x \sec x dx + e^x \log(\sec x + \tan x) - \int e^x \left\{ \frac{d}{dx} \log(\sec x + \tan x) \right\} dx$$

$$= \int e^x \sec x dx + e^x \log(\sec x + \tan x) - \int e^x \sec x dx$$

$$= e^x \log(\sec x + \tan x) + c$$

Indefinite Integrals Ex 19.26 Q9

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

Integrating by parts

= 
$$\int e^x \log \sin x dx + \int e^x \cot x dx$$

$$= (\log \sin x)e^x - \int e^x \left(\frac{d}{dx} \log \sin x\right) dx + \int e^x \cot x dx$$
$$= e^x \log \sin x - \int e^x \cot x dx + \int e^x \cot x dx$$

$$=e^{x}\log\sin x+c$$

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