Calculus Practice 3.3B5: Techniques for Finding Antiderivatives 21a

Evaluate each indefinite integral.

1) $\int \sin \ln x \, dx$

A) Use: $u = \sin \ln x$, $dv = dx$

$$\int \sin \ln x \, dx = \frac{\sin x - \cos x}{2e^x} + C$$

B) Use: $u = \sin \ln x$, $dv = dx$

$$\int \sin \ln x \, dx = \frac{e^x \sin x + e^x \cos x}{2} + C$$

C) Use: $u = \sin \ln x$, $dv = dx$

$$\int \sin \ln x \, dx = \frac{x\sin \ln x - x\cos \ln x}{2} + C$$

D) Use: $u = \sin \ln x$, $dv = dx$

$$\int \sin \ln x \, dx = \frac{x\cos \ln x + x\sin \ln x}{2} + C$$

2) $\int e^x \cos x \, dx$

A) Use: $u = e^x$, $dv = \cos x \, dx$

$$\int e^x \cos x \, dx = \frac{x\cos \ln x + x\sin \ln x}{2} + C$$

B) Use: $u = e^x$, $dv = \cos x \, dx$

$$\int e^x \cos x \, dx = x^2 \sin x + 2x\cos x - 2\sin x + C$$

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3) $\int \cos \ln\ x\, dx$

A) Use: $u = \cos \ln\ x,\ \ dv = dx$

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D) Use: $u = \cos \ln\ x,\ \ dv = dx$

$$\int \cos \ln\ x\, dx = -x^2 \cos x + 2x\sin x + 2\cos x + C$$

4) $\int \cos x \cdot e^{-x}\, dx$

A) Use: $u = e^{-x},\ \ dv = \cos x\, dx$

$$\int \cos x \cdot e^{-x}\, dx = x^2 \sin x + 2x\cos x - 2\sin x + C$$

B) Use: $u = e^{-x},\ \ dv = \cos x\, dx$

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

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