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Calculus: Early Transcendentals - James Stewart

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7 Techniques of Integration

- $\int x^n \, dx = \frac{x^{n+1}}{n+1} + C \quad (n \neq 1)$
- $\int \frac{1}{x} \, dx = \ln \frac{x}{y} |a|$
- $\int e^x \, dx = e^x + C$
- $\int b^x \, dx = \frac{b^x}{\ln b} + C$
- $\int \sin x \, dx = -\cos x + C$
- $\int \cos x \, dx = \sin x + C$
- $\int \sec^x \, dx = \tan x + C$
- $\int \csc^2 x \, dx = -\cot x + C$
- $\int \sec x \tan x \, dx = \sec x + C$
- $\int \cosh x \, dx = \sinh x + C$
- $\int \sinh x \, dx = \cosh x + C$
- $\int \cot x \, dx \ln|\sin x| + C$
- $\int \tan x \, dx = \ln|\sec x| + C$
- $\int \frac{1}{\sqrt{a^2 - x^2}} \, dx = \arcsin\left(\frac{x}{a}\right) + C \quad x > 0$
- $\int \frac{1}{x^2 + a^2} \, dx = \frac{1}{a} \arctan \frac{x}{a} + C$

7.1 Integration by parts

7.1.1 Summary

7.1.2 Exercises

37. $\int e^{\sqrt{x}} \, dx = 2te^4 - 2e^t + C\left(t = \sqrt{x} \Longrightarrow 2t \, dt = dx\right).$

38. $\int \cos(\ln x)\,dx = \frac{x[\sin(\ln x) + \cos(\ln x)]}{2} + C.$
39. $\int_{\sqrt{\pi/2}}^{\sqrt{\pi}} \theta^3 \cos(\theta^2)\,d\theta = -\left(\frac{\pi}{4} + \frac{1}{2}\right).$
40. $\int_0^{\pi} e^{\cos t} \sin 2t\,dt = 4e^{-1}.$
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7.2

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