

7 5 Strategies for Integration

Lesson 319 | Calculus BC | Integration by substitution • Integration by parts • Integrating partial fractions

<https://www.youtube.com/watch?v=pwiqSUSTIKI>

Related review: exact coverage needs teacher confirmation.

Name: _____ Date: _____ Show your reasoning.

01

Find an antiderivative of $110 \cdot x \cdot (11 \cdot x^2 + 9)^4$.

02

Find an antiderivative of $7 \cdot (x + 2) \cdot \exp(7 \cdot x)$.

03

Find an antiderivative of $(5 \cdot x + 9) / ((x + 3) \cdot (x + 5))$ for $x > 0$.

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04

Find an antiderivative of $156 \cdot x \cdot (13 \cdot x^2 + 3)^5$.

05

Find an antiderivative of $(7 \cdot x + 10) \cdot \exp(4 \cdot x)$.

06

Find an antiderivative of $(x - 16)/((x + 2) \cdot (x + 4))$ for $x > 0$.

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01

Find an antiderivative of $110 \cdot x \cdot (11 \cdot x^2 + 9)^4$.

Substitute $u=11x^2+9$, so $du=22x \, dx$; integrate the resulting power of u . An antiderivative is $(11 \cdot x^2 + 9)^5 + C$. Differentiate to check.

02

Find an antiderivative of $7 \cdot (x + 2) \cdot \exp(7 \cdot x)$.

Use $u=7x+14$ and $dv=e^{7x}dx$ in $\int u \, dv=uv-\int v \, du$. An antiderivative is $(x + 13/7) \cdot \exp(7 \cdot x) + C$. Differentiate to check.

03

Find an antiderivative of $(5 \cdot x + 9)/((x + 3) \cdot (x + 5))$ for $x > 0$.

Use partial fractions $8/(x+5) - 3/(x+3)$; integrate each reciprocal. Replace $\ln$ by $\ln|\cdot|$ for other domain intervals. An antiderivative is $-3 \cdot \log(x + 3) + 8 \cdot \log(x + 5) + C$. Differentiate to check.

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04

Find an antiderivative of $156 \cdot x \cdot (13 \cdot x^2 + 3)^5$.

Substitute $u=13x^2+3$, so $du=26x \, dx$; integrate the resulting power of u . An antiderivative is $(13 \cdot x^2 + 3)^6 + C$. Differentiate to check.

05

Find an antiderivative of $(7 \cdot x + 10) \cdot \exp(4 \cdot x)$.

Use $u=7x+10$ and $dv=e^{(4x)}dx$ in $\int u \, dv=uv-\int v \, du$. An antiderivative is $(28 \cdot x + 33) \cdot \exp(4 \cdot x)/16 + C$. Differentiate to check.

06

Find an antiderivative of $(x - 16)/((x + 2) \cdot (x + 4))$ for $x > 0$.

Use partial fractions $10/(x+4) - 9/(x+2)$; integrate each reciprocal. Replace $\ln$ by $\ln|\cdot|$ for other domain intervals. An antiderivative is $-9 \cdot \log(x + 2) + 10 \cdot \log(x + 4) + C$. Differentiate to check.