

Calculus 5.5 Part II Substitution Technique of Integration

Lesson 301 | Calculus AB | Integration by substitution

<https://www.youtube.com/watch?v=O1Px9PU4Q-0>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01

Find an antiderivative of $144 \cdot x^3 + 96 \cdot x$.

02

Find an antiderivative of $1500 \cdot x \cdot (2 \cdot x^2 + 1)^2$.

03

Find an antiderivative of $66 \cdot x \cdot (11 \cdot x^2 + 3)^2$.

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Name: _____ Date: _____ Show your reasoning.

04 Find an antiderivative of $2304 \cdot x \cdot (3 \cdot x^2 + 4)^5$.

05 Find an antiderivative of $156 \cdot x \cdot (13 \cdot x^2 + 10)^5$.

06 Find an antiderivative of $96 \cdot x \cdot (12 \cdot x^2 + 5)^3$.

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01 Find an antiderivative of $144 \cdot x^3 + 96 \cdot x$.

Substitute $u=6x^2+4$, so $du=12x \, dx$; integrate the resulting power of u . An antiderivative is $4 \cdot (3 \cdot x^2 + 2)^2 + C$. Differentiate to check.

02 Find an antiderivative of $1500 \cdot x \cdot (2 \cdot x^2 + 1)^2$.

Substitute $u=10x^2+5$, so $du=20x \, dx$; integrate the resulting power of u . An antiderivative is $125 \cdot (2 \cdot x^2 + 1)^3 + C$. Differentiate to check.

03 Find an antiderivative of $66 \cdot x \cdot (11 \cdot x^2 + 3)^2$.

Substitute $u=11x^2+3$, so $du=22x \, dx$; integrate the resulting power of u . An antiderivative is $(11 \cdot x^2 + 3)^3 + C$. Differentiate to check.

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04

Find an antiderivative of $2304 \cdot x \cdot (3 \cdot x^2 + 4)^5$.

Substitute $u=6x^2+8$, so $du=12x \, dx$; integrate the resulting power of u . An antiderivative is $64 \cdot (3 \cdot x^2 + 4)^6 + C$. Differentiate to check.

05

Find an antiderivative of $156 \cdot x \cdot (13 \cdot x^2 + 10)^5$.

Substitute $u=13x^2+10$, so $du=26x \, dx$; integrate the resulting power of u . An antiderivative is $(13 \cdot x^2 + 10)^6 + C$. Differentiate to check.

06

Find an antiderivative of $96 \cdot x \cdot (12 \cdot x^2 + 5)^3$.

Substitute $u=12x^2+5$, so $du=24x \, dx$; integrate the resulting power of u . An antiderivative is $(12 \cdot x^2 + 5)^4 + C$. Differentiate to check.