

Calculus 5.5 Part I Substitution Technique of Integration

Lesson 300 | Calculus AB | Integration by substitution

<https://www.youtube.com/watch?v=uaNr9ntWzco>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01 Find an antiderivative of $640 \cdot x \cdot (2 \cdot x^2 + 3)^4$.

02 Find an antiderivative of $768 \cdot x \cdot (x^2 + 3)^5$.

03 Find an antiderivative of $72 \cdot x \cdot (12 \cdot x^2 + 5)^2$.

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Name: _____ Date: _____ Show your reasoning.

04

Find an antiderivative of $1600 \cdot x \cdot (5 \cdot x^2 + 3)^4$.

05

Find an antiderivative of $48 \cdot x \cdot (8 \cdot x^2 + 7)^2$.

06

Find an antiderivative of $1600 \cdot x \cdot (5 \cdot x^2 + 7)^4$.

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01 Find an antiderivative of $640 \cdot x \cdot (2 \cdot x^2 + 3)^4$.

Substitute $u=4x^2+6$, so $du=8x \, dx$; integrate the resulting power of u . An antiderivative is $32 \cdot (2 \cdot x^2 + 3)^5 + C$. Differentiate to check.

02 Find an antiderivative of $768 \cdot x \cdot (x^2 + 3)^5$.

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

03 Find an antiderivative of $72 \cdot x \cdot (12 \cdot x^2 + 5)^2$.

Substitute $u=12x^2+5$, so $du=24x \, dx$; integrate the resulting power of u . An antiderivative is $(12 \cdot x^2 + 5)^3 + C$. Differentiate to check.

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04

Find an antiderivative of $1600 \cdot x \cdot (5 \cdot x^2 + 3)^4$.

Substitute $u=10x^2+6$, so $du=20x \, dx$; integrate the resulting power of u . An antiderivative is $32 \cdot (5 \cdot x^2 + 3)^5 + C$. Differentiate to check.

05

Find an antiderivative of $48 \cdot x \cdot (8 \cdot x^2 + 7)^2$.

Substitute $u=8x^2+7$, so $du=16x \, dx$; integrate the resulting power of u . An antiderivative is $(8 \cdot x^2 + 7)^3 + C$. Differentiate to check.

06

Find an antiderivative of $1600 \cdot x \cdot (5 \cdot x^2 + 7)^4$.

Substitute $u=10x^2+14$, so $du=20x \, dx$; integrate the resulting power of u . An antiderivative is $32 \cdot (5 \cdot x^2 + 7)^5 + C$. Differentiate to check.