Watch. Practice. Understand. | Lesson 301

Calculus 5.5 Part II Substitution Technique of Integration

Watch the matching video: https://www.youtube.com/watch?v=O1Px9PU4Q-0

Practice focus: Integration by substitution

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

01 Integrate $2x(x^2+1)^3$ dx.

02 Integrate cos(3x) dx.

03 Evaluate the integral of 2x e^(x^2) from 0 to 1.

04 Integrate $x/(x^2+4)$ dx.

Worked answers | Lesson 301

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Practice focus: Integration by substitution

Original extra practice matched to the listed lesson topic.

01 Integrate $2x(x^2+1)^3$ dx.

Let $u=x^2+1$, $du=2x\,dx$. Integral $u^3\,du = u^4/4+C = (x^2+1)^4/4+C$.

02 Integrate cos(3x) dx.

Let $u=3x$. Result $(1/3)\sin(3x)+C$.

03 Evaluate the integral of 2x e^(x^2) from 0 to 1.

$u=x^2$ changes bounds to 0 and 1. Integral e^u du = e-1.

04 Integrate $x/(x^2+4)$ dx.

Let $u=x^2+4$, $du=2x\,dx$. Result $(1/2)\ln(x^2+4)+C$.