

Watch. Practice. Understand. | Lesson 300

Calculus 5.5 Part I Substitution Technique of Integration

Watch the matching video: <https://www.youtube.com/watch?v=uaNr9ntWzco>

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 300

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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 $(1/2)\ln(x^2+4)+C$.