The Substitution Rule: Examples

SYMPLIT

1. Evaluate the integral $\int \tan^3 x \sec^2 x \, dx$ by making the substitution $u = \tan x$.

2. Evaluate the integral $\int (3x+4)^{22} dx$.

3. Evaluate the integral $\int \frac{\sec^2 \sqrt{x}}{\sqrt{x}} dx$

4. Evaluate the integral $\int e^x \cos(3 - e^x) dx$

5. Evaluate the integral $\int \frac{1}{x\sqrt{\ln x}} dx$

6. Evaluate the integral $\int 3x(9x-4)^{10} dx$

7. Evaluate the integral $\int 2x^5 \sqrt[3]{x^3+2} \, dx$

8. Evaluate the integral $\int_{\frac{3}{2\pi}}^{\frac{3}{\pi}} \frac{\sin(1/x)}{x^2} dx$

9. Evaluate the integral $\int_2^7 2x\sqrt{x+2} \, dx$

10. Evaluate the integral $\int_0^5 (x-7)\sqrt{25-x^2} \, dx$ by writing it as a sum of two integrals and interpreting one of them as an area.

11. If f is continuous on $\mathbb{R}$ prove that $\int_a^b x f(x^2) dx = \frac{1}{2} \int_{a^2}^{b^2} f(x) dx$