

Example 1. Find the indefinite integral $\int 4\sqrt{x} + 3 \cos 2x \, dx$.

Example 2. (1) Compute the derivative of $F(x) = \sin(2x^3)$.

(2) Compute the indefinite integral $\int 6x^2 \cos(2x^3) \, dx$

Example 3. Find the indefinite integral $\int \frac{\sin \sqrt{x}}{\sqrt{x}} \, dx$

Example 4. Find the indefinite integral $\int \frac{4x^3 - x}{\sqrt{2x^4 - x^2 + 5}} \, dx$

Example 5. Find the indefinite integral $\int e^{x^2+2} x \, dx$

Example 6. Find the indefinite integral $\int \tan x \, dx$

Example 7. Find the indefinite integral $\int (\sin(1 - e^x)) e^x \, dx$

Example 8. Compute the definite integral $\int_1^2 \frac{x}{\sqrt{x^2 + 3}} \, dx$

Example 9. Compute the definite integral $\int_0^{\pi/2} 3 \sin^4 x \cos x \, dx$

Example 10. Compute the definite integral $\int_{-1}^2 x^2 \sqrt{x^3 + 1} \, dx$

Example 11. Compute the definite integral $\int_e^{e^2} \frac{1}{x(\ln x)^3} \, dx$

Example 12. Find the indefinite integral $\int x\sqrt{x+2} \, dx$