

For each integral decide which of the following is needed: 1) substitution, 2) algebra or a trig identity, 3) nothing needed, or 4) can't be done by the techniques in Calculus I. Then evaluate each integral (except for the 4th type of course).

A. $\int (x^3 + 1) dx$

$\int x^2 (x^3 + 1)^4 dx$

$\int \sqrt{x^3 + 1} dx$

$\int (x^3 + 1)^2 dx$

B. $\int \sqrt{x} (1 - x^2) dx$

$\int \sqrt{1 - x^2} dx$

$\int \frac{1}{\sqrt{1 - x^2}} dx$

$\int \frac{x dx}{\sqrt{1 - x^2}}$

C. $\int \cos^2 x \sin^3 x dx$

$\int \sqrt{1 - \cos^2 x} dx$

$\int \frac{dx}{\cos^2 x}$

$\int \frac{dx}{\cos x \sqrt{\sin x}}$

D. $\int \tan x \sec x dx$

$\int \tan x \cos x dx$

$\int \frac{\sec^2 x}{\sqrt{\tan x}} dx$

$\int \frac{dx}{\tan x + 1}$

E. $\int e^{-x^2} dx$

$\int \frac{e^x}{3 + e^x} dx$

$\int (e^x + 3) dx$

$\int \frac{\ln(e^{2x})}{x^2} dx$