

7.1 Integration by Substitution

Name:

Date:

P 1. Evaluate

(a) $\int_0^1 \frac{x}{1+x^2} dx$

(b) $\int_0^{\pi/4} \frac{\sin x}{\cos x} dx$

P 15. Find

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

P 19. Find

$$\int x^2 e^{x^3+1} dx$$

P 21. Find

$$\int \frac{1}{\sqrt{4-x}} dx$$

P 29. Find

$$\int \frac{(\ln z)^2}{z} dz$$

P 35. Find

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

P 55. Find the general antiderivative of $f(x) = \frac{x}{x^2 + 1}$.

P 79. Show that

$$\int_0^{\pi/3} 3 \sin^2(3x) \, dx = \int_0^{\pi} \sin^2(y) \, dy$$

P 85. Explain why the two integrals are the same.

$$\int \frac{e^x dx}{1 + e^{2x}} \text{ and } \int \frac{\cos x dx}{1 + \sin^2 x}$$