

Workshop Exercises: Techniques of Integration II

1. Evaluate the definite integrals using the Fundamental Theorem of Calculus.

a. $\int_0^5 3x^2 dx$

b. $\int_0^3 (x^2 - 7x + 12) dx$

c. $\int_0^\pi \sin(x) dx$

d. $\int_{\frac{\pi}{2}}^{\frac{3\pi}{2}} \cos(x) dx$

e. $\int_1^e \frac{1}{x} dx$

f. $\int_0^1 \frac{1}{1+x^2} dx$

2. Evaluate each indefinite integral using substitution.

a. $\int \frac{1}{x^2+4x+4} dx$

b. $\int 2x\sqrt{x^2+12} dx$

c. $\int -5x^3(x^2-4)^4 dx$

d. $\int \frac{\sin(2x)}{\cos(2x)} dx$

e. $\int \frac{\ln x}{x} dx$

f. $\int 3 \sec(x) \cdot \tan(x) \cdot \sec^2(x) dx$

g. $\int 3x^2 e^{x^3} dx$

h. $\int e^x \cdot e^x \cdot e^x dx$