



1 Evaluate the indefinite integrals by making the given substitutions.

1. $\int 2x^3 \sqrt{x^4 + 2} dx$ with $u = x^4 + 2$
2. $\int x^2 \cos(x^3 - 1) dx$, with $u = x^3 - 1$
3. $\int 3e^{2-x} dx$, with $u = 2 - x$
4. $\int \frac{x}{4-x} dx$, with $u = 4 - x$

2 Use substitution to evaluate the indefinite integrals.

1. $\int (4 - x)^{2/3} dx$
2. $\int (x^2 - 2x)(x^3 - 3x^2 + 3)^{2/3} dx$
3. $\int \sin x e^{\cos x} dx$

3 Let $g(x)$ be a continuous function whose derivative $g'(x)$ is also continuous. Use substitution to evaluate the indefinite integral

$$\int g'(x) e^{g(x)} dx.$$

4 Use substitution to evaluate the definite integral

$$\int_0^{\pi/3} \frac{\sin x}{\cos^2 x} dx.$$

5 Use integration by parts to evaluate the indefinite integrals.

1. $\int 3x \sin x dx$
2. $\int 2x^2 e^{-x} dx$

6 Use integration by parts to evaluate the definite integrals.

1. $\int_0^{\pi/4} 2x \sin x dx$
2. $\int_1^e \ln x^3 dx$

- 7 Use an appropriate substitution followed by integration by parts to evaluate

$$\int x^5 e^{-x^3/3} dx.$$