

INTEGRATION PRACTICE

In Exercises 1 to 15 use the given substitution to find the anti-derivative.

- $\int (1 + 3x)^5 3 dx; u = 1 + 3x.$
- $\int \frac{x}{(1 + x^2)^3} dx; u = 1 + x^2.$
- $\int e^{\sin \theta} \cos \theta d\theta; u = \sin \theta.$
- $\int \frac{x}{\sqrt{1 + x^2}} dx; u = 1 + x^2.$
- $\int \sqrt{1 + x^2} x dx; u = 1 + x^2.$
- $\int \sin 2x dx; u = 2x.$
- $\int \frac{e^{2x}}{(1 + e^{2x})^2} dx; u = 1 + e^{2x}.$
- $\int e^{3x} dx; u = 3x.$
- $\int \frac{e^{1/x}}{x^2} dx; u = 1/x.$
- $\int \frac{t dt}{\sqrt{2 - 5t^2}}; u = 2 - 5t^2.$
- $\int \tan \theta \sec^2 \theta d\theta; u = \tan \theta.$
- $\int \frac{\sin \sqrt{x}}{\sqrt{x}} dx; u = \sqrt{x}.$

$$14. \int \frac{(\ln x)^4}{x} dx; u = \ln x.$$

$$15. \int \frac{\sin(\ln x)}{x} dx; u = \ln x.$$

In Exercises 16 to 30 choose an appropriate substitution and find the antiderivative.

$$16. \int (1 - x^2)^5 x dx$$

$$17. \int \frac{x dx}{(x^2 + 1)^3}$$

$$18. \int \sqrt[3]{1 + x^2} x dx$$

$$19. \int \frac{\sin \theta}{\cos^2 \theta} d\theta$$

$$20. \int \frac{e^{\sqrt{t}}}{\sqrt{t}} dt$$

$$21. \int \sin 3\theta d\theta$$

$$22. \int e^x \sin e^x dx$$

$$23. \int \frac{dx}{\sqrt{2x + 5}}$$

$$24. \int (x - 3)^{5/2} dx$$

$$25. \int \frac{dx}{(4x + 3)^3}$$

$$27. \int \frac{2x + 3}{(x^2 + 3x + 5)^4} dx$$

$$28. \int e^{2x} dx$$

$$29. \int \frac{dx}{\sqrt{x}(1 + \sqrt{x})^3}$$

$$30. \int x^4 \sin x^5 dx$$