

Integration by Substitution

Evaluate each indefinite integral. Use the provided substitution.

1) $\int -15x^4(-3x^5 - 1)^5 dx; u = -3x^5 - 1$

2) $\int -16x^3(-4x^4 - 1)^{-5} dx; u = -4x^4 - 1$

3) $\int -\frac{8x^3}{(-2x^4 + 5)^5} dx; u = -2x^4 + 5$

4) $\int (5x^4 + 5)^{\frac{2}{3}} \cdot 20x^3 dx; u = 5x^4 + 5$

5) $\int \frac{(5 + \ln x)^5}{x} dx; u = 5 + \ln x$

6) $\int 4\sec 4x \cdot \tan 4x \cdot \sec^4 4x dx; u = \sec 4x$

7) $\int 36x^3(3x^4 + 3)^5 dx; u = 3x^4 + 3$

8) $\int x(4x - 1)^4 dx; u = 4x - 1$

Evaluate each indefinite integral.

$$9) \int -9x^2(-3x^3 + 1)^3 dx$$

$$10) \int 12x^3(3x^4 + 4)^4 dx$$

$$11) \int -12x^2(-4x^3 + 2)^{-3} dx$$

$$12) \int (3x^5 - 3)^{\frac{3}{5}} \cdot 15x^4 dx$$

$$13) \int (-2x^4 - 4)^4 \cdot -32x^3 dx$$

$$14) \int (e^{4x} - 4)^{\frac{1}{5}} \cdot 8e^{4x} dx$$

$$15) \int x(4x + 5)^3 dx$$

$$16) \int 5x\sqrt{2x + 3} dx$$

Integration by Substitution

Evaluate each indefinite integral. Use the provided substitution.

$$1) \int -15x^4(-3x^5 - 1)^5 dx; u = -3x^5 - 1$$

$$\frac{1}{6}(-3x^5 - 1)^6 + C$$

$$2) \int -16x^3(-4x^4 - 1)^{-5} dx; u = -4x^4 - 1$$

$$-\frac{1}{4(-4x^4 - 1)^4} + C$$

$$3) \int -\frac{8x^3}{(-2x^4 + 5)^5} dx; u = -2x^4 + 5$$

$$-\frac{1}{4(-2x^4 + 5)^4} + C$$

$$4) \int (5x^4 + 5)^{\frac{2}{3}} \cdot 20x^3 dx; u = 5x^4 + 5$$

$$\frac{3}{5}(5x^4 + 5)^{\frac{5}{3}} + C$$

$$5) \int \frac{(5 + \ln x)^5}{x} dx; u = 5 + \ln x$$

$$\frac{1}{6}(5 + \ln x)^6 + C$$

$$6) \int 4 \sec 4x \cdot \tan 4x \cdot \sec^4 4x dx; u = \sec 4x$$

$$\frac{1}{5} \cdot \sec^5 4x + C$$

$$7) \int 36x^3(3x^4 + 3)^5 dx; u = 3x^4 + 3$$

$$\frac{1}{2}(3x^4 + 3)^6 + C$$

$$8) \int x(4x - 1)^4 dx; u = 4x - 1$$

$$\frac{1}{96}(4x - 1)^6 + \frac{1}{80}(4x - 1)^5 + C$$

Evaluate each indefinite integral.

$$9) \int -9x^2(-3x^3 + 1)^3 dx$$

$$\frac{1}{4}(-3x^3 + 1)^4 + C$$

$$10) \int 12x^3(3x^4 + 4)^4 dx$$

$$\frac{1}{5}(3x^4 + 4)^5 + C$$

$$11) \int -12x^2(-4x^3 + 2)^{-3} dx$$

$$-\frac{1}{2(-4x^3 + 2)^2} + C$$

$$12) \int (3x^5 - 3)^{\frac{3}{5}} \cdot 15x^4 dx$$

$$\frac{5}{8}(3x^5 - 3)^{\frac{8}{5}} + C$$

$$13) \int (-2x^4 - 4)^4 \cdot -32x^3 dx$$

$$\frac{4}{5}(-2x^4 - 4)^5 + C$$

$$14) \int (e^{4x} - 4)^{\frac{1}{5}} \cdot 8e^{4x} dx$$

$$\frac{5}{3}(e^{4x} - 4)^{\frac{6}{5}} + C$$

$$15) \int x(4x + 5)^3 dx$$

$$\frac{1}{80}(4x + 5)^5 - \frac{5}{64}(4x + 5)^4 + C$$

$$16) \int 5x\sqrt{2x + 3} dx$$

$$\frac{1}{2}(2x + 3)^{\frac{5}{2}} - \frac{5}{2}(2x + 3)^{\frac{3}{2}} + C$$