Integration by Substitution

1. Find the indefinite integral
(Similar to p.342 #1-6)

$$\int \left(4x^3 \sqrt{x^4 + 2}\right)dx$$

2. Find the indefinite integral
(Similar to p.342 #1-6)

$$\int \left(\frac{\cos x}{\sin^4 x}\right)dx$$

3. Find the indefinite integral
(Similar to p.342 #11-38)

$$\int \left(x^3 - 2\right)^4 \left(3x^2\right)dx$$

4. Find the indefinite integral
(Similar to p.342 #11-38)

$$\int x^2 \left(x^3 + 1\right)^3 dx$$

5. Find the indefinite integral
(Similar to p.342 #11-38) NEXT TIME
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$$\int t^4 \sqrt{t^5 + 3}\ dt$$

6. Find the indefinite integral
(Similar to p.342 #11-38)

$$\int \frac{x^2}{(5x^3 - 3)^2}\, dx$$

7. Find the indefinite integral
(Similar to p.342 #11-38)

$$\int \left[x^3 - \frac{1}{(5x)^3} \right] dx$$

8. Find the indefinite integral
(Similar to p.342 #11-38)

$$\int \frac{x - 3x^3}{\sqrt[3]{x}}\, dx$$

9. Solve the differential equation
(Similar to p.342 #39-42)

$$\frac{dy}{dx} = \frac{x + 2}{\sqrt{x^2 + 4x + 5}}$$

10. Find the indefinite integral
(Similar to p.342 #49-82)

$$\int 2x \sin\left(x^2\right) dx$$

11. Find the indefinite integral
(Similar to p.342 #49-82)

$$\int -14xe^{-7x^2 + 3}\, dx$$

12. Find the indefinite integral
(Similar to p.342 #49-82) NEXT TIME

$$\int x \sin(x^2 - 3) \cos(x^2 - 3)\, dx$$

13. Find the indefinite integral
(Similar to p.342 #49-82)

$$\int \sqrt[3]{\tan x}\, \sec^2 x\, dx$$

14. Find the indefinite integral
(Similar to p.342 #49-82)

$$\int \frac{\cos x}{\sin^4 x}\, dx$$

15. Find the indefinite integral
(Similar to p.342 #49-82)

$$\int \frac{e^{3x} + 4e^x + 1}{e^x}\, dx$$

16. Find the indefinite integral
(Similar to p.342 #49-82)

$$\int \ln(e^{3x+4})\, dx$$

17. Find an equation for the function f that has the given derivative and whose graph passes through the given point
(Similar to p.343 #83-88)

$$Derivative \qquad Point$$

$$-\,-\,-\,-\,-\,-\,- \qquad -\,-\,-\,-$$

$$f'(x) = 0.2^{x/3} \qquad \left(0, \frac{1}{3}\right)$$

18. Find the particular solution of the differential equation that satisfies the initial conditions
(Similar to p.343 #89-90)

$$f''(x) = \cos x + e^{3x}, \quad f(0) = \frac{1}{2}, \quad f'(0) = \frac{1}{3}$$

19. Find the indefinite integral
(Similar to p.343 #91-98)

$$\int x\sqrt{3x+2}\, dx$$

20. Find the indefinite integral
(Similar to p.343 #91-98)

$$\int \frac{4x+2}{\sqrt{x+2}}\, dx$$

21. Find the definite integral
(Similar to p.343 #91-98)

$$\int_0^2 \frac{x}{\sqrt{3+4x^2}}\, dx$$

22. Use the differential equation and the given point to find an equation of the function
(Similar to p.344 #117-120)

$$\frac{dy}{dx} = 5 + \frac{x^2}{\left(5x^3+1\right)^2}, (0,1)$$

23. Find the area of the region
(Similar to p.344 #121-126)

$$y = \cos x + \sin(2x), \quad 0 \le x \le \frac{\pi}{2}$$

24. Use a graphing utility to evaluate the integral.
(Similar to p.344 #131-138)

$$\int_{2}^{4} x\sqrt{x-2}\, dx$$