Antiderivatives and Indefinite Integration

1. Verify the statement by showing that the derivative of the right side equals the integrand of the left side
(Similar to p.291 #1-4)

$$\int \left(2x^3 - \frac{1}{x^2} \right) dx = \frac{1}{2} x^4 + \frac{1}{x} + C$$

2. Find the general solution of the differential equation and check the result by differentiation
(Similar to p.291 #5-8)

$$\frac{dy}{dx} = 5x^{-2}$$

3. Find the indefinite integral
(Similar to p.291 #9-14)

$$\int \left(\frac{1}{3x^4} \right) dx$$

4. Find the indefinite integral
(Similar to p.291 #9-14)

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

5. Find the indefinite integral
(Similar to p.291 #15-44)

$$\int \left(5x^3 - 7x^2 + 3x - 2 \right) dx$$

6. Find the indefinite integral
(Similar to p.291 #15-44)

$$\int \left(\sqrt[5]{x^2} - 2 \right) dx$$

7. Find the indefinite integral
(Similar to p.291 #15-44)

$$\int \left(\frac{x^2 + 5x - 2}{x^5} \right) dx$$

8. Find the indefinite integral
(Similar to p.291 #15-44)

$$\int \left(\theta^3 - \csc^2 \theta \right) d\theta$$

9. Find the indefinite integral
(Similar to p.291 #15-44)

$$\int \left(5x^2 - 4e^x \right) dx$$

10. Find the indefinite integral
(Similar to p.291 #15-44)

$$\int \left(\frac{1}{\cos^2 x} \right) dx$$

11. Find the indefinite integral
(Similar to p.291 #15-44)

$$\int \left(\frac{\sin x}{1 - \sin^2 x} \right) dx$$

12. Find the indefinite integral
(Similar to p.291 #15-44)

$$\int \left(\sin x + 5^x\right) dx$$

13. Find the indefinite integral
(Similar to p.291 #15-44)

$$\int \left(\frac{5}{x} + \csc^2 x\right) dx$$

14. Solve the differential equation
(Similar to p.292 #63-72)

$$g'(x) = 5x^2, \quad g(0) = -2$$

15. Solve the differential equation
(Similar to p.292 #63-72)

$$f''(x) = \cos x, \quad f'(0) = 1, \quad f(0) = 4$$