

Find the antiderivative of the function.

1. $y' = 12x^3 - 6x + 5$

2. $y' = 2x^4 + x^3 - x$

3. $f'(x) = 5 \sin x - \frac{2}{x}$

4. $g'(x) = \frac{4}{\sqrt[3]{x}} + 3 \csc x \cot x$

Evaluate the expression.

5. $\int (3x^2 - 8x + 7) dx$

6. $\int \left(15x^{2/3} + \frac{6}{x^3} \right) dx$

7. $\int 9e^y - 2 \cos y dy$

8. $\int \left(\frac{1}{x^4} + \frac{2}{x} \right) dx$

9. $x^3 + 5x^2 + 3x + C$ 10. $4x^{3/2} + 2\sqrt{x} + C$ 11. $\frac{8^x}{\ln 8} - 7 \cot x + C$
12. $\sec \theta - \tan \theta + C$ 13. $f(x) = 7x^2 + 8x - 3$ 14. $g(x) = 3 \sin x + 2^x + 5$

Evaluate the expression.

9. $\int (3x + 1)(x + 3) dx$

10. $\int \left(\frac{6x+1}{\sqrt{x}} \right) dx$

11. $\int 8^x + 7\csc^2 x dx$

12. $\int \sec \theta (\tan \theta - \sec \theta) d\theta$

Find the function that satisfies the given conditions.

13. $f'(x) = 14x + 8$ and $f(-2) = 9$

14. $g'(x) = 3 \cos x + 2^x \cdot \ln 2$ and $g(0) = 6$

1. $y = 3x^4 - 3x^2 + 5x + C$ 2. $y = \frac{2}{5}x^5 + \frac{1}{4}x^4 - \frac{1}{2}x^2 + C$ 3. $f(x) = -5 \cos x - 2 \ln |x| + C$

4. $g(x) = 6x^{2/3} - 3 \csc x + C$ 5. $x^3 - 4x^2 + 7x + C$ 6. $9x^{5/3} - \frac{3}{x^2} + C$

7. $9e^y - 2 \sin y + C$ 8. $-\frac{1}{x^3} + 2 \ln |x| + C$