

INTEGRATION PROBLEMS

1. $\int (2x^3 + 5x + 1)e^{2x} dx$
2. $\int e^{\cos 2x} \sin x \cos x dx$
3. $\int \frac{\sec^2 x}{2 + \tan x} dx$
4. $\int \frac{x^2 - 1}{x + 3} dx$
5. $\int \frac{e^x}{\sqrt{3 - e^{2x}}} dx$
6. $\int \frac{1}{\sqrt{x(1 + 3\sqrt{x})}} dx$
7. $\int_1^2 x^3 \ln x dx$
8. $\int_{\pi/6}^{\pi/3} \frac{1}{1 + \cos x} dx$
9. $\int \frac{e^{2x}}{4 + e^{2x}} dx$
10. $\int_{-4}^2 \frac{4}{x^2 + 2x + 10} dx$
11. $\int \cos(4x) \sqrt{1 + \sin(4x)} dx$
12. $\int \frac{1 - \sin x}{\cos x} dx$
13. $\int \frac{dx}{x\sqrt{\ln x}}$
14. $\int \frac{x+1}{x^2-4} dx$

ANSWERS

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

2. $-\frac{1}{4}e^{\cos 2x} + C$

3. $\ln |2 + \tan x| + C$

4. $\frac{x^2}{2} - 3x + 8 \ln |x + 3| + C$

5. $\sin^{-1}(\frac{e^x}{\sqrt{3}}) + C$

6. $\frac{2}{3} \ln |1 + 3\sqrt{x}| + C$

7. $4 \ln 2 - \frac{15}{16}$

8. $\frac{4\sqrt{3}-6}{3}$

9. $\frac{1}{2} \ln |4 + e^{2x}| + C$

10. $\frac{2\pi}{3}$

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

12. $\ln |1 + \sin x| + C$

13. $2\sqrt{\ln x} + C$

14. $\frac{3}{4} \ln |x - 2| + \frac{1}{4} \ln |x + 2| + C$