BÀI TẬP TÍCH PHÂN

Dạng 1: Tính toán giá trị tích phân cơ bản

Bài 1. Tính giá trị các tích phân sau

I1 = $\int_0^1 \frac{5x-13}{x^2-5x+6}dx$

I2 = $\int_0^1 (2x+1)e^{2x}dx$

I3 = $\int_0^1 \frac{dx}{x^2+3x+2}$

I4 = $\int_0^{\frac{\pi}{2}} \frac{\cos x+\sin x.\cos x}{2+\sin x}dx$

I5 = $\int_0^{\frac{\pi}{2}} e^{\sin^2 x}.\sin 2x dx$

I6 = $\int_0^1 x^3(1-x^2)^3 dx$

I7 = $\int_0^{\frac{\pi}{2}} e^{\sin x}\cos x dx$

I8 = $\int_0^{\frac{\pi}{2}} \sin^3 x\cos x dx$

I9 = $\int_0^1 (2x+1)e^{2x}dx$

I10 = $\int_1^4 \frac{e^{\sqrt{x}}}{\sqrt{x}}dx$

I11 = $\int_0^{\frac{\pi}{2}} \left(1+\sin^2 x\right)^2 \sin 2x dx$

I12 = $\int_1^4 \frac{dx}{x(1+\sqrt{x})}$

I13 = $\int_{\ln 3}^{\ln 8} \frac{e^{2x}dx}{\sqrt{e^x+1}}$

I14 = $\int_0^7 \frac{dx}{\sqrt{x+2}+1}$

I15 = $\int_0^{\sqrt{3}} x^5\sqrt{x^2+1}dx$

I16 = $\int_0^{\sqrt{7}} \frac{x^3}{\sqrt[3]{1+x^2}}dx$

I17 = $\int_0^{\sqrt[3]{3}} \frac{x^5}{\sqrt{x^3+1}}dx$

I18 = $\int_{\sqrt[3]{3}}^2 \frac{dx}{x\sqrt{1+x^3}}$

I19 = $\int_{\sqrt{7}}^4 \frac{dx}{x\sqrt{x^2+9}}$

I20 = $\int_0^4 \frac{xdx}{\sqrt{2x+1}}$

I21 = $\int_0^{\frac{\pi}{2}} e^{1+2\sin x}.\cos x dx$

I22 = $\int_0^1 \frac{x}{1+\sqrt{x}}dx$

I23 = $\int_0^{\ln\sqrt{2}} \frac{dx}{e^x+e^{-x}}$

I24 = $\int_{\frac{\pi}{6}}^{\frac{\pi}{2}} \frac{\cos x}{\sin^3 x}dx$

I25 = $\int_0^1 e^x \sin e^x dx$

I26 = $\int_0^1 (x^2+1).e^x dx$

Bài 2. Tính giá trị các tích phân sau

I1 = $\int_1^2 x\sqrt{x^2+3}dx$

I2 = $\int_0^{\pi} x.\sin x dx$

I3 = $\int_0^{\pi}(e^{\cos x}+1).\sin x dx$

I4 = $\int_0^1 xe^{-x}dx$

I5 = $\int_0^1 (x+1)e^x dx$

I6 = $\int_1^e \sqrt{x}\ln x.dx$

I7 = $\int_0^{\frac{\pi}{2}}(2x+1).\cos x.dx$

I8 = $\int_2^3 \frac{3}{-5x^2+2x+3}dx$

I9 = $\int_2^3 \frac{2x+3}{5x^2+3x-8}dx$

I10 = $\int_1^2 \frac{x^2-4x+7}{x+1}dx$

I11 = $\int_0^1 \frac{x^2+4x+7}{x^2+3x+2}dx$

I12 = $\int_0^1 \frac{2x^2+3x-1}{x^2-x-2}dx$

I13 = $\int_0^1 \frac{x^4}{x-3}dx$

I14 = $\int_0^1 \frac{x^3-4x^2+2x+7}{x+1}dx$

Bài 3. Tính giá trị các tích phân sau

I1 = $\int_0^{2\pi}\sqrt{1-\cos 2x}dx$

I2 = $\int_1^3 (x+\frac{1}{x})^2 dx$

I3 = $\int_0^2 (x^2\sqrt{x}+1)dx$

I4 = $\int_1^3 |x^2-4x+3|dx$

I5 = $\int_0^{16}\frac{1}{\sqrt{x+9}-\sqrt{x}}dx$

I6 = $\int_0^{\frac{\pi}{4}}\tan^2 x dx$

I7 = $\int_0^{\frac{\pi}{2}}\sin x.\cos^2(x-\frac{\pi}{4})dx$

I8 = $\int_0^1 \frac{x^2+x+1}{x+1}dx$

I9 = $\int_{\frac{-\pi}{4}}^{\frac{\pi}{2}}\cos 5x.\sin 3x dx$

I10 = $\int_0^{\pi}(\sin^4\frac{x}{2}-\cos^4\frac{x}{2})dx$

I11 = $\int_0^{\frac{\pi}{4}}\frac{\cos x+\sin x.\cos x}{2+\sin x}dx$

I12 = $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}}\frac{dx}{\sin^2(5x+6)}$

Bài 4. Tính giá trị các tích phân sau

I1 = $\int_0^1 \frac{xdx}{(x+1)^2}$

I2 = $\int_0^1 \frac{x^7 dx}{x^2+1}$

I3 = $\int_0^{\frac{\pi}{2}} \cos^3 x dx$

I4 = $\int_0^{\frac{\pi}{4}} \frac{dx}{\cos^4 x}$

I5 = $\int_0^{\frac{\pi}{2}} \frac{\sin x dx}{\cos x + \sin x}$

I6 = $\int_1^4 \frac{dx}{x^2(x+1)}$

Bài 5. Tính giá trị các tích phân sau

I1 = $\int_1^2 (x^2-1)^{25} x dx$

I2 = $\int_0^1 x^5 \sqrt{x^6+1} dx$

I3 = $\int_0^1 \frac{x+2}{x^2+4x+7} dx$

I4 = $\int_0^3 \frac{2x+1}{\sqrt{x^2+x+1}} dx$

I5 = $\int_0^{\frac{\pi}{2}} e^{\cos^2 x} \sin x.\cos x dx$

I6 = $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{\cos^3 x}{\sin^2 x} dx$

I7 = $\int_0^{\frac{\pi}{2}} \sin^5 x dx$

I8 = $\int_0^{\frac{\pi}{2}} \sqrt[6]{1-\cos^3 x}.\sin x.\cos^5 x dx$

I9 = $\int_1^e \frac{1+\ln^3 x}{x} dx$

I10 = $\int_0^{\frac{\pi}{3}} (\sin^3 x + e^{\sin x}).\cos x dx$

I11 = $\int_0^{\ln 2} (3+e^x)^5 e^x dx$

I12 = $\int_4^9 \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$

I13 = $\int_1^2 \frac{(x+1)dx}{x^2+x\ln x}$

Bài 6. Tính giá trị các tích phân sau

I1 = $\int_0^1 \frac{dx}{1+x^2}$

I2 = $\int_0^{\sqrt{2}} \sqrt{2-x^2} dx$

I3 = $\int_{\sqrt{2}}^2 \frac{dx}{x\sqrt{x^2-1}}$

I4 = $\int_{\frac{1}{2}}^{\frac{\sqrt{3}}{2}} \frac{dx}{\sqrt{1-x^2}}$

I5 = $\int_1^{\sqrt{3}} \frac{\sqrt{9+3x^2} dx}{x^2}$

I6 = $\int_0^{\frac{\pi}{6}} \frac{\sin 2x dx}{2\sin^2 x + \cos^2 x}$

I7 = $\int_{\sqrt{3}}^{\sqrt{8}} \frac{dx}{x\sqrt{x^2+1}}$

Bài 7. Tính giá trị các tích phân sau

I1 = $\int_0^1 (x+1)e^{2x}dx$

I2 = $\int_1^2 x^2e^{2x}dx$

I3 = $\int_0^{\frac{\pi}{6}} (1-x)\sin 3xdx$

I4 = $\int_3^5 x^2\ln(x-1)dx$

I5 = $\int_0^{\pi} e^x\cos xdx$

I6 = $\int_0^{e^{\pi}} \cos(\ln x)dx$

I7 = $\int_1^2 \frac{\ln(1+x)}{x^2}dx$

I8 = $\int_0^{\frac{\pi}{2}} \cos x.\ln(1+\cos x)dx$

Bài 8. Tính giá trị các tích phân sau (nâng cao)

I1 = $\int_0^1 x^2(e^{2x}+\sqrt{x^3+1})dx$

I2 = $\int_{e^2}^{e^5} \frac{\ln x.\ln(\ln x)dx}{x}$

I3 = $\int_0^{\frac{\pi}{2}} (x+\sin^3 x+e^{\sin x}).\cos xdx$

Bài 9. Tính giá trị các tích phân sau

I1 = $\int_1^e \frac{(\ln x+2013)^2}{x}dx$

I2 = $\int_0^1 \frac{3x}{(x^2+3)^2}dx$

I3 = $\int_1^2 \frac{x^3}{\sqrt{x^4+1}}dx$

I4 = $\int_0^{\sqrt{3}} x^5\sqrt{1+x^2}dx$

I5 = $\int_o^{\frac{\pi}{2}} \frac{\sin x}{2+\cos x}dx$

I6 = $\int_0^{\frac{\pi}{2}} \frac{\sin 2x}{\sqrt{\cos^2 x+2\sin^2 x}}dx$

I7 = $\int_0^{\frac{\pi}{2}} \cos x\sqrt{\cos x-\cos^3 x}dx$

I8 = $\int_0^{\frac{\pi}{2}} (e^{\sin x}+\cos x)\cos xdx$

I9 = $\int_0^{\frac{\pi}{2}} \frac{\cos xdx}{\sin^2 x+4\sin x+3}$

Bài 10. Tính giá trị các tích phân sau

I1 = $\int_1^e \frac{\ln x}{x^2}dx$

I2 = $\int_0^{\frac{\pi}{2}} x.\cos\frac{3x}{2}.\cos\frac{x}{2}dx$

I3 = $\int_0^1 x^3 \ln(x^2+1)dx$

I4 = $\int_0^1 \frac{x}{x^4+3x^2+2}dx$

I5 = $\int_0^1 x\ln(x+\sqrt{x^2+1})dx$

I6 = $\int_0^{\frac{\pi}{3}} x.\tan^2 xdx$

I7 = $\int_0^{\ln 3} \frac{xe^x}{\sqrt{e^x+1}}dx$

I8 = $\int_0^1 \frac{2x^3-4x^2-x-3}{x^2-2x-3}dx$

I9 = $\int_e^{e^3} \frac{dx}{x\ln x\ln(\ln x)}$

I10 = $\int_1^{\ln 2} \frac{e^{2x}}{\sqrt{e^x+2}}dx$

I11 = $\int_1^2 \frac{2(2x-1)}{(x+2)(x^2+1)}dx$

I12 = $\int_{e^{\frac{\pi}{2}}}^{e^{\frac{\pi}{4}}} \frac{dx}{x\sin^2(\ln x)}$

I13 = $\int_1^2 \frac{x^2-1}{x^4+1}dx$

I14 = $\int_{-3}^3 |x^2-4|dx$

I15 = $\int_{\frac{\pi}{6}}^{\frac{\pi}{4}} \frac{dx}{\sin^2 x.\sqrt[4]{\cot x}}$

Bài 11. Tính giá trị các tích phân sau

I1 = $\int_{\ln 2}^{\ln 3} \frac{e^x dx}{\sqrt{(e^x+1)^3}}$

I2 = $\int_0^1 \frac{e^x-e^{-x}}{e^x+e^{-x}}dx$

I3 = $\int_{\ln 3}^{\ln 5} \frac{dx}{e^x+2e^{-x}-3}$

I4 = $\int_1^{\sqrt{3}} \frac{dx}{x^6(1+x^2)}$

I5 = $\int_0^{\ln 3} \frac{e^x dx}{2(e^x+1)\sqrt{e^x+1}}$

I6 = $\int_0^1 \frac{x^2}{(1+x^2)^2}$

I7 = $\int_0^1 \sqrt{2x-x^2}dx$

I8 = $\int_0^{\frac{1}{2}} \frac{\sqrt{1-x^2}}{1-x}dx$

I9 = $\int_0^{\frac{\pi}{2}} \frac{\sin 2x}{\sqrt{\cos^2 x+4\sin^2 x}}dx$

I10 = $\int_1^e \frac{\sqrt{1+3\ln x}\ln x}{x}dx$

I11 = $\int_0^{\frac{\pi}{4}} \frac{1-2\sin^2 x}{1+\sin 2x}dx$

I12 = $\int_0^{\frac{\pi}{2}} \frac{\sin 2x+\sin x}{\sqrt{1+3\cos x}}dx$

I13 = $\int_1^e \frac{\ln x}{x(2+\ln x)^2}dx$

I14 = $\int_{\sqrt{5}}^{2\sqrt{3}} \frac{dx}{x\sqrt{x^2+4}}$

Bài 12. Tính giá trị các tích phân sau

I1 = $\int_0^{\pi} \cos 3x.\cos 2x.dx$

I2 = $\int_0^{\pi} \sin x.\sin 3x.dx$

I3 = $\int_0^{\frac{\pi}{6}} \sin 2x.\cos x.dx$

I4 = $\int_0^{\frac{\pi}{2}} \sin^4 x.\cos^3 x.dx$

I5 = $\int_0^{\frac{\pi}{4}} \frac{1}{\cos^4 x}.dx$

I6 = $\int_0^{\pi} \sin^3 x.\cos^2 x.dx$

I7 = $\int_0^{\frac{\pi}{2}} \frac{sin2x}{\cos^2 x+3}.dx$

I8 = $\int_0^{\pi} \sin^4 x.dx$

I9 = $\int_0^{\frac{\pi}{2}} \frac{sin2x}{3-\sin^2 x}.dx$

I10 = $\int_0^{\frac{\pi}{2}} e^{2+\sin^2 x}.\sin 2x.dx$

I11 = $\int_{\frac{\pi}{2}}^{\pi} \cos^5 x.dx$

I12 = $\int_{\frac{\pi}{6}}^{\frac{\pi}{4}} \frac{1}{\sin^4 x}.dx$

I13 = $\int_0^{\pi} \cos^4 x.dx$

I14 = $\int_0^{\pi} \cos^3 x.dx$

Bài 13. Tính giá trị các tích phân sau

I1 = $\int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \sin^3 x\cos^2 x dx$

I2 = $\int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \sin^2 x\cos^3 x dx$

I3 = $\int_0^{\frac{\pi}{2}} \frac{\sin x}{1+3\cos x} dx$

I4 = $\int_0^{\frac{\pi}{4}} tgx dx$

I5 = $\int_{\frac{\pi}{6}}^{\frac{\pi}{4}} \cot gx dx$

I6 = $\int_0^{\frac{\pi}{6}} \sqrt{1+4\sin x}\cos x dx$

I7 = $\int_0^1 x\sqrt{x^2+1} dx$

I8 = $\int_0^1 x\sqrt{1-x^2} dx$

I9 = $\int_0^1 x^3\sqrt{x^2+1} dx$

I10 = $\int_0^1 \frac{x^2}{\sqrt{x^3+1}} dx$

I11 = $\int_0^1 x^3\sqrt{1-x^2} dx$

I12 = $\int_1^2 \frac{1}{x\sqrt{x^3+1}} dx$

I13 = $\int_0^1 \frac{1}{1+x^2}dx$

I14 = $\int_{-1}^1 \frac{1}{x^2+2x+2}dx$

I15 = $\int_0^1 \frac{1}{\sqrt{x^2+1}}dx$

I16 = $\int_0^1 \frac{1}{(1+3x^2)^2}dx$

I17 = $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} e^{\sin x}\cos x dx$

I18 = $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} e^{\cos x}\sin x dx$

I19 = $\int_0^1 e^{x^2+2}x dx$

I20 = $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} e^{\sin x}\cos x dx$

I21 = $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} e^{\cos x}\sin x dx$

I22 = $\int_0^1 e^{x^2+2}x dx$

I23 = $\int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \sin^3 x\cos^2 x dx$

I24 = $\int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \sin^2 x\cos^3 x dx$

I25 = $\int_0^{\frac{\pi}{2}} \frac{\sin x}{1+3\cos x}dx$

I26 = $\int_0^{\frac{\pi}{4}} tgx dx$

I27 = $\int_{\frac{\pi}{6}}^{\frac{\pi}{4}} \cot gx dx$

Bài 14. Tính giá trị các tích phân sau

I1 = $\int_0^{\frac{\pi}{6}} \sqrt{1+4\sin x}\cos x dx$

I2 = $\int_0^1 x\sqrt{x^2+1}dx$

I3 = $\int_0^1 x\sqrt{1-x^2}dx$

I4 = $\int_0^1 x^3\sqrt{x^2+1}dx$

I5 = $\int_0^1 \frac{x^2}{\sqrt{x^3+1}}dx$

I6 = $\int_0^1 x^3\sqrt{1-x^2}dx$

I7 = $\int_1^2 \frac{1}{x\sqrt{x^3+1}}dx$

I8 = $\int_1^e \frac{\sqrt{1+\ln x}}{x}dx$

I9 = $\int_1^e \frac{\sin(\ln x)}{x}dx$

I10 = $\int_1^e \frac{\sqrt{1+3\ln x}\ln x}{x}dx$

I11 = $\int_1^e \frac{e^{2\ln x+1}}{x}dx$

I12 = $\int_e^{e^2} \frac{1+\ln^2 x}{x\ln x}dx$

I13 = $\int_e^{e^2} \frac{1}{\cos^2(1+\ln x)}dx$

I14 = $\int_1^2 \frac{x}{1+\sqrt{x-1}}dx$

I15 = $\int_0^1 \frac{x}{\sqrt{2x+1}}dx$

I16 = $\int_0^1 x\sqrt{x+1}dx$

I17 = $\int_0^1 \frac{1}{\sqrt{x+1}+\sqrt{x}}dx$

I18 = $\int_0^1 \frac{1}{\sqrt{x+1}-\sqrt{x}}dx$

I19 = $\int_1^3 \frac{\sqrt{x+1}}{x}dx$

I20 = $\int_1^e \frac{\sqrt{1+\ln x}}{x}dx$

I21 = $\int_1^e \frac{\sin(\ln x)}{x}dx$

I22 = $\int_1^e \frac{\sqrt{1+3\ln x}\ln x}{x}dx$

I23 = $\int_1^e \frac{e^{2\ln x+1}}{x}dx$

I24 = $\int_e^{e^2} \frac{1+\ln^2 x}{x\ln x}dx$