

ТИПОВЕ ЗАВДАННЯ № 4
«НЕВИЗНАЧЕНИЙ ІНТЕГРАЛ»

Знайти інтеграли:

ВАРІАНТ 1

1 $\int \frac{(x+1)^3}{\sqrt{x}} dx$

2 $\int \frac{\sqrt[4]{\lg x} dx}{\sin^2 x}$

3 $\int e^{-x^4} x^3 dx$

4 $\int x^3 \arctg x dx$

5 $\int \frac{x+1}{2x-x^2} dx$

6 $\int \frac{(x^2-5)dx}{(x^2-4x+5)(x^2+9)}$

7 $\int \frac{dx}{(x-2)^3(x^2-2x+2)^2}$

8 $\int e^{4x} \cos 4x dx$

9 $\int \frac{dx}{x^2\sqrt{x^2-9}}$

10 $\int \frac{2x^2-3x}{\sqrt{x^2-2x+5}} dx$

11 $\int x^{-2/3} (1+x^{1/3})^{-3} dx$

12 $\int \frac{dx}{3-4\sin 2x+2\cos^2 x}$

13 $\int \frac{3chx}{2shx+3chx} dx$

14 $\int \frac{\cos^3 x dx}{\sqrt[5]{\sin^3 x}}$

15 $\int \frac{\ln 2x}{x \ln 4x} dx$

ВАРІАНТ 2

1 $\int (x^3 - \frac{2}{\sqrt[3]{x^2}} + 1) dx$

2 $\int \frac{e^{2x} dx}{\sqrt{1+e^{4x}}}$

3 $\int 2^{x^2} x dx$

4 $\int x^2 \arctg 4x dx$

5 $\int \frac{dx}{x^2-8x+14}$

6 $\int \frac{(x+1)dx}{x(x^4+6x^2+8)}$

7 $\int \frac{(x^3-6)dx}{x^4+6x^2+8}$

8 $\int e^{5x} \sin 5x dx$

9 $\int \frac{\sqrt{x-1}-\sqrt{x+1}}{\sqrt{x-1}+\sqrt{x+1}} dx$

10 $\int \frac{x^3 dx}{\sqrt{x^2+x+1}}$

11 $\int x^{1/2} (1+x^{1/3})^{-2} dx$

12 $\int \frac{dx}{4+\lg x+4\ctg x}$

13 $\int \frac{3}{2shx+3chx} dx$

14 $\int \sin^2 2x \cos^4 2x dx$

15 $\int \frac{\ln \tg x dx}{\sin 2x}$

ВАРІАНТ 3

1 $\int \frac{(\sqrt{x}+x)^3}{5x} dx$

2 $\int \frac{\ln \arccos x dx}{\sqrt{1-x^2} \arccos x}$

3 $\int e^{x^2-2} x dx$

4 $\int x^3 \sin 5x dx$

5 $\int \frac{(x-1)dx}{x^3+x}$

6 $\int \frac{dx}{x^2(x^2+4)^2}$

7 $\int \frac{dx}{(x^2-2x+2)^3}$

8 $\int x^2 e^x \sin x dx$

9 $\int \frac{dx}{1+\sqrt{x}+\sqrt{1+x}}$

10 $\int \frac{(x^3+2x^2+x-1)dx}{\sqrt{x^2+2x-1}}$

11 $\int \frac{x dx}{\sqrt[4]{x^3(x-4)}}$

12 $\int \frac{dx}{4+\ctg x-4\lg x}$

13 $\int \frac{7}{2shx-4chx} dx$

14 $\int \sin^2 3x \cos^4 3x dx$

15 $\int e^{\sqrt{x}} dx$

ВАРІАНТ 4

$$1 \int \frac{(\sqrt{x}+3)^2}{x} dx$$

$$2 \int \frac{2x-4}{(x^2-4x+5)^3} dx$$

$$3 \int \frac{\sqrt{1+\ln x}}{x} dx$$

$$4 \int \arctg(7x+2) dx$$

$$5 \int \frac{7x-5}{x^3+x^2-6x} dx$$

$$6 \int \frac{(3x^3+2x^2+1)dx}{x(x+1)^2(x^2+4)}$$

$$7 \int \frac{(3x-1)dx}{(x^2+16)^3}$$

$$8 \int e^{3x} \sin x dx$$

$$9 \int \frac{\sqrt{x-2}-\sqrt{x+2}}{\sqrt{x-2}+\sqrt{x+2}} dx$$

$$10 \int \frac{x+3}{\sqrt{4x^2+4x+3}} dx$$

$$11 \int x^{1/2} (1+x^{1/3})^{-2} dx$$

$$12 \int \frac{2 \cos x - 3 \sin x}{2 \sin x + 3 \cos x} dx$$

$$13 \int \frac{chx+2}{2shx+3chx} dx$$

$$14 \int \sqrt[5]{\sin^3 2x} \cos^3 2x dx$$

$$15 \int \sin x \ln tg x dx$$

ВАРІАНТ 5

$$1 \int \left(\frac{3}{25+x^2} - 3^x \right) dx$$

$$2 \int \frac{\arcsin^2 x}{\sqrt{1-x^2}} dx$$

$$3 \int \frac{x dx}{\sqrt{x+1}}$$

$$4 \int x \arcsin x dx$$

$$5 \int \frac{x dx}{x^2+5x+8}$$

$$6 \int \frac{dx}{(x+1)(x^2+1)(x^3+1)}$$

$$7 \int \frac{(x^3+2x-1)dx}{x^2(x^2+2x+5)^2}$$

$$8 \int e^{3x} \cos x dx$$

$$9 \int x^2 \sqrt[3]{(x+1)^2} dx$$

$$10 \int \frac{dx}{x - \sqrt{x^2 - x + 1}}$$

$$11 \int x^{1/4} (1+x^{1/3})^{-2} dx$$

$$12 \int \frac{\sin 2x dx}{\sin^4 x + \cos^4 x}$$

$$13 \int \frac{shx+2}{2shx+5chx} dx$$

$$14 \int \frac{\cos^3 x dx}{\sqrt[3]{\sin^2 x}}$$

$$15 \int \frac{dx}{e^x + \sqrt{e^x}}$$

ВАРІАНТ 6

$$1 \int \frac{3-2 \sin^2 x}{\sin^2 x} dx$$

$$2 \int \frac{\ln \arcsin x}{\sqrt{1-x^2} \arcsin x} dx$$

$$3 \int e^{3x^2-5} x dx$$

$$4 \int x^2 e^{2x} dx$$

$$5 \int \frac{dx}{x^2+4x+14}$$

$$6 \int \frac{x^3+2x^2+3x+4}{x^4+x^3+2x^2} dx$$

$$7 \int \frac{(x-1)dx}{(x^2-2x+5)^3}$$

$$8 \int e^x \sin 2x dx$$

$$9 \int \frac{dx}{\sqrt[4]{(x+2)^5(x-1)^3}}$$

$$10 \int \frac{(x^3-2x^2+1)dx}{\sqrt{x^2-7x+10}}$$

$$11 \int \frac{x dx}{\sqrt{1+\sqrt[3]{x^2}}}$$

$$12 \int \frac{3 \cos x + 7 \sin x}{5 \sin x + 2 \cos x} dx$$

$$13 \int \frac{shx-2}{2shx+chx} dx$$

$$14 \int \frac{\sin^3 x dx}{\sqrt[3]{\cos^4 x}}$$

$$15 \int \cos^7 x dx$$

ВАРІАНТ 7

1 $\int \frac{\sin 2x}{\sin^2 x} dx$

2 $\int e^{2x^2+2x-1} (2x+1) dx$

3 $\int \frac{3x^2 dx}{x^6 - 25}$

4 $\int 2^{-x} x dx$

5 $\int \frac{x dx}{2x^2 - x + 1}$

6 $\int \frac{(3x^2 + 4x - 1) dx}{(x^2 + 4x + 29)^2}$

7 $\int \frac{(x^3 - 2x^2 + x + 6) dx}{x(x-1)^2(x^2 + 4x + 5)}$

8 $\int e^x \cos 2x dx$

9 $\int \frac{dx}{2\sqrt{x} - \sqrt[3]{x} - \sqrt[4]{x}}$

10 $\int \frac{(x^2 + 4x) dx}{\sqrt{x^2 + x + 1}}$

11 $\int \sqrt[3]{x + 2x^3} dx$

12 $\int \frac{\sin x dx}{\sqrt{1 + 4 \cos x + \cos^2 x}}$

13 $\int \frac{shx}{2shx + chx} dx$

14 $\int \frac{3 \sin^2 x}{\cos^4 x} dx$

15 $\int \frac{1 + \sin x}{1 + \cos x} e^x dx$

ВАРІАНТ 8

1 $\int \frac{5}{\sin^2 x \cos^2 x} dx$

2 $\int e^{2x^2 + \ln x} dx$

3 $\int \frac{\sin 2x}{3 + \sin^2 x} dx$

4 $\int \arctg 2x dx$

5 $\int \frac{dx}{6x^2 + 6x + 19}$

6 $\int \frac{(x+2) dx}{(x-1)^2 x (x^2 + 4)}$

7 $\int \frac{x^5 + x^4 + x^3 + x^2 + x + 1}{x^2 (x^2 + 2x + 10)^2} dx$

8 $\int e^{2x} \cos 3x dx$

9 $\int \frac{1 - \sqrt{x+1}}{1 + \sqrt[3]{x+1}} dx$

10 $\int \frac{(x^3 - x - 1) dx}{\sqrt{x^2 + 2x + 2}}$

11 $\int \sqrt[3]{x - x^3} dx$

12 $\int \frac{dx}{2 \sin^2 x + 7 \cos^2 x}$

13 $\int \frac{thx}{2shx + chx} dx$

14 $\int \sin^5 x \cos^4 x dx$

15 $\int \sqrt{\frac{x+1}{x-1}} dx$

ВАРІАНТ 9

1 $\int \frac{(1+x)^2}{x(1+x^2)} dx$

2 $\int \frac{e^{tgx} + ctgx}{\cos^2 x} dx$

3 $\int \frac{dx}{x\sqrt{x+1}}$

4 $\int x^2 \ln x dx$

5 $\int \frac{(9x+13) dx}{(x+3)(x^2 + 2x + 3)}$

6 $\int \frac{(x^4 - 1) dx}{(x^2 + 9)(x^3 + x^2)}$

7 $\int \frac{(3x+1) dx}{(x^2 - 4x + 5)^3}$

8 $\int e^{2x} \sin 3x dx$

9 $\int \frac{dx}{\sqrt[3]{4x^2 + 1} - \sqrt{2x+1}}$

10 $\int x^2 \sqrt{x^2 + 4} dx$

11 $\int \frac{dx}{x^3 \sqrt[3]{2 - x^3}}$

12 $\int \frac{(1 + \cos x)^2 dx}{1 + \sin x}$

13 $\int \frac{chx + 1}{2shx - 5chx} dx$

14 $\int \frac{\sin^3 x dx}{\sqrt[5]{\cos^3 x}}$

15 $\int \frac{x \arccos x / a}{\sqrt{a^2 - x^2}} dx$

ВАРІАНТ 10

$$1 \int \frac{x^2}{x^2 + 4} dx$$

$$2 \int \sqrt{\sin x} \cos^5 x dx$$

$$3 \int \frac{dx}{e^x + e^{-x}}$$

$$4 \int (x+2) \cos 3x dx$$

$$5 \int \frac{20dx}{(x+4)(x^2+4x+20)}$$

$$6 \int \frac{(x^3 - 2x^2 + 3x - 1)dx}{(x^2 + 8x + 17)(x^2 + 6x + 34)}$$

$$7 \int \frac{dx}{(x^2 + 1)(x^2 + 2x + 5)^2}$$

$$8 \int e^{2x+1} \sin x dx$$

$$9 \int \sqrt{\frac{a+x}{a-x}} dx$$

$$10 \int \frac{(x^3 - 6x^2 + 11x - 6)dx}{\sqrt{x^2 + 4x + 3}}$$

$$11 \int x^{-1/2} (1 + x^{1/4})^{-10} dx$$

$$12 \int \frac{(\sin 2x)^2 dx}{(\sin^3 x + \cos^3 x)^2}$$

$$13 \int \frac{chx - 1}{2shx - 5chx} dx$$

$$14 \int \frac{dx}{\sin^5 x}$$

$$15 \int x^3 \sqrt{x^2 - 1} dx$$

ВАРІАНТ 11

$$1 \int \frac{x^3(x+1)}{\sqrt{x}} dx$$

$$2 \int \frac{x^3 dx}{x^8 - 18}$$

$$3 \int \frac{1+x}{1+\sqrt{x}} dx$$

$$4 \int (x^2 - 2x + 3) \ln(x+1) dx$$

$$5 \int \frac{(3x+4)dx}{4x^2 - 12x + 13}$$

$$6 \int \frac{(x+5)dx}{(x+2)^2(x^4 - 1)}$$

$$7 \int \frac{dx}{(x^2 + 16)^3}$$

$$8 \int e^{2x+1} \cos x dx$$

$$9 \int x \sqrt{\frac{x-1}{x+1}} dx$$

$$10 \int \frac{(1-x+x^2)dx}{\sqrt{1+x-x^2}}$$

$$11 \int \frac{dx}{x^6 \sqrt{x^6 + 1}}$$

$$12 \int \frac{5 \sin x - 3 \cos x}{7 \sin x + 2 \cos x} dx$$

$$13 \int \frac{shx - 1}{2shx + 5chx} dx$$

$$14 \int \frac{dx}{\sin^2 x \cos^2 x}$$

$$15 \int \frac{dx}{x^2 \sqrt{x^2 - 16}}$$

ВАРІАНТ 12

$$1 \int \frac{x^6 + 1}{x^2} dx$$

$$2 \int \frac{e^x dx}{\sqrt{4 - e^{2x}}}$$

$$3 \int \frac{1+x}{1-\sqrt{x}} dx$$

$$4 \int \arccos(3x-2) dx$$

$$5 \int \frac{(2x^3 + 3)dx}{(4x^2 - 1)(x^2 + 6x)}$$

$$6 \int \frac{x^4 + 4x^3 + 3x^2 + 12x + 20}{x^2 + 4x + 5} dx$$

$$7 \int \frac{(x^2 + 1)dx}{x^2(x^2 - 6x + 58)^2}$$

$$8 \int e^{4x} \sin 4x dx$$

$$9 \int \frac{dx}{\sqrt{(x-7)^7(x-5)^5}}$$

$$10 \int x \sqrt{x^2 + 2x + 2} dx$$

$$11 \int \frac{\sqrt[3]{x} dx}{\sqrt{1 + \sqrt[3]{x}}}$$

$$12 \int \frac{\sin x \sin 2x dx}{\sin x + \cos x}$$

$$13 \int \frac{3shx}{2shx + chx} dx$$

$$14 \int \sqrt[3]{\cos^2 2x} \sin^3 x dx$$

$$15 \int \frac{(2x^2 + 2x + 13)dx}{(x^2 + 1)(x^3 - 2x^2 + x - 2)}$$

ВАРІАНТ 13

1 $\int \frac{x^2 + 2x\sqrt{x} + 3}{\sqrt{x}} dx$

2 $\int e^x \sin(e^x) dx$

3 $\int \frac{dx}{\sqrt{3-2x}}$

4 $\int (x^2 - 5) \cos 4x dx$

5 $\int \frac{x-1}{x^2+6x+8} dx$

6 $\int \frac{(x^5-1)dx}{(x+1)^2(x^2+9)^2}$

7 $\int \frac{x^4+x^3+x^2+x+1}{x^2(x^2+4x+40)^2} dx$

8 $\int e^x \cos 5x dx$

9 $\int \frac{dx}{\sqrt[5]{(x-1)^6(x+2)^4}}$

10 $\int \frac{x^4 dx}{\sqrt{x^2+4x+5}}$

11 $\int x^{-2/3} (1+x^{1/3})^{-3} dx$

12 $\int \frac{ctg^3 x + ctgx}{4+tg^2 x} dx$

13 $\int \frac{chx+shx}{2shx-chx} dx$

14 $\int \sqrt[5]{\sin^4 x} \cos^3 x dx$

15 $\int e^{-|x|} dx$