

КОНТРОЛЬНАЯ РАБОТА № 1

Вычислить неопределенные интегралы:

Вариант №1

$$1. \int \left(3x + 7x^2 - \cos x + \frac{3}{1+x^2} \right) dx;$$

$$2. \int 7^{3x-5} dx;$$

$$3. \int 7^x (4 \cos(7^x) - 1) dx;$$

$$4. \int \frac{x+3}{x^2-6x+1} dx;$$

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

$$6. \int (5x-8)e^{10x} dx;$$

$$7. \int \cos^6 3x dx;$$

$$8. \int \frac{dx}{\sqrt[3]{x} + \sqrt{x}}.$$

Вариант №2

$$1. \int \left(2x^2 + 7 \cos x - \frac{3}{4-x^2} \right) dx;$$

$$2. \int (7x-10)^4 dx;$$

$$3. \int x(3x^2-10)^4 dx;$$

$$4. \int \frac{3x-1}{\sqrt{x^2+3x-1}} dx;$$

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

$$6. \int (7x-2) \log_{12} x dx;$$

$$7. \int \sin^5 x dx;$$

$$8. \int \frac{x dx}{\sqrt{x-2} + \sqrt[3]{x-2}}.$$

Вариант №3

$$1. \int \left(2 \cos x - 3 + \frac{4}{x} - e^x \right) dx;$$

$$2. \int \frac{dx}{\sqrt{11+6x}};$$

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

$$4. \int \frac{3x+6}{x^2-x+8} dx;$$

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

$$6. \int 3^{x-1} \cos 2x dx;$$

$$7. \int \sin^2 x \cos^9 x dx;$$

$$8. \int \frac{dx}{\sqrt{x-1} + 2\sqrt[4]{x-1}}.$$

Вариант №4

$$1. \int \left(\frac{3}{\cos^2 x} - \frac{7}{6+x^2} - 2x + 3 \right) dx;$$

$$3. \int \frac{x^2 dx}{33-x^3};$$

$$5. \int \frac{x+6}{(x-2)(x-3)(x+8)} dx;$$

$$7. \int \sin^7 x dx;$$

$$2. \int \frac{dx}{(33-x)^3};$$

$$4. \int \frac{4x-1}{\sqrt{x^2+2x-11}};$$

$$6. \int (2x^3+x) \log_4 x dx;$$

$$8. \int \frac{dx}{\sqrt[3]{3x+1}}.$$

Вариант №5

$$1. \int \left(2e^x - 2^x + \frac{3}{\sqrt{1-x^2}} - 1 \right) dx;$$

$$3. \int \frac{dx}{\sin^2(4x)};$$

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

$$7. \int \frac{dx}{1+\cos 2x};$$

$$2. \int (3\operatorname{tg}x - 7)^8 \frac{dx}{\cos^2 x};$$

$$4. \int \frac{3x}{x^2-4x+8} dx;$$

$$6. \int 2^{3x} \sin x dx;$$

$$8. \int \frac{\sqrt{x} dx}{1+\sqrt{x}}.$$

Вариант №6

$$1. \int \left(3\cos x - 6\sin x - \frac{1}{\sqrt{1-x^2}} + 2 \right) dx;$$

$$3. \int 5^x \cos 5^x dx;$$

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

$$7. \int \frac{dx}{1+\sin x - \cos x};$$

$$2. \int 3^{7x+1} dx;$$

$$4. \int \frac{2x-1}{\sqrt{x^2+4x}} 4x;$$

$$6. \int (\cos 3x)x^3 dx;$$

$$8. \int \frac{\sqrt{6x-1}}{3+\sqrt{6x-1}} dx.$$

Вариант №7

$$1. \int \left(2 \cdot 5^x - 6x^3 + 8x - \frac{3}{x} \right) dx;$$

$$2. \int \cos(31x+8) dx;$$

3. $\int \frac{(5 \ln x - 1)^{10}}{x} dx;$

4. $\int \frac{7x - 1}{x^2 + 8x - 12} dx;$

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

6. $\int \arcsin \sqrt{x} dx;$

7. $\int \frac{dx}{\cos x - 2 \sin x};$

8. $\int \frac{dx}{4 + \sqrt{x - 2}}.$

Вариант №8

1. $\int \left(3 \cdot 7^x - \frac{2}{x^2 + 1} - \frac{1}{x^2 - 1} \right) dx;$

2. $\int \frac{dx}{\sin^2(12x)};$

3. $\int \frac{\operatorname{arctg} x}{1 + x^2} dx;$

4. $\int \frac{2 - x}{\sqrt{3 - x^2 - 2x}} dx;$

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

6. $\int (4x^2 - 1)e^{3x} dx;$

7. $\int \sin^8 x dx;$

8. $\int \frac{dx}{\sqrt{x - 1}}.$

Вариант №9

1. $\int (3 \sin x - 2\sqrt{x} - \sqrt[3]{x}) dx;$

2. $\int (5 \cos x - 7)^4 \sin x dx;$

3. $\int \sin(4x - 2) dx;$

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

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

6. $\int (4x + 8)e^{3x} dx;$

7. $\int \sin^4 x \cos^4 x dx;$

8. $\int \frac{xdx}{\sqrt{x} + \sqrt[3]{x}}.$

Вариант №10

1. $\int \left(\frac{3}{\sin^2 x} - \frac{4}{1 - x^2} + \frac{6}{\sqrt{x^2 + 1}} \right) dx;$

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

3. $\int \sqrt{\cos x} \cdot \sin x dx;$

4. $\int \frac{5x}{\sqrt{6 - x^2 - x}} dx;$

5. $\int \frac{x + 1}{(x - 1)(x + 3)(x + 8)} dx;$

6. $\int 2^{3x} \cos x dx;$

7. $\int \cos^2 3x \sin 5x dx;$

8. $\int \frac{dx}{\sqrt{x+7}+1}.$

Вариант №11

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

2. $\int \cos(3x - 1) dx;$

3. $\int x^5 3^{x^6+2} dx;$

4. $\int \frac{4x-1}{x^2-2x} dx;$

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

6. $\int x^2 \cos^2 x dx;$

7. $\int \cos^3 3x \sin 5x dx;$

8. $\int \frac{x}{\sqrt{3x-4}+8} dx.$

Вариант №12

1. $\int \left(\frac{2}{x^2} + \frac{3}{x} - \frac{7}{\sqrt[3]{x^2}} \right) dx;$

2. $\int x e^{x^2} dx;$

3. $\int \frac{\sqrt[5]{\operatorname{tg} x - 2}}{\cos^2 x} dx;$

4. $\int \frac{3x}{4x+x^2-8} dx;$

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

6. $\int (3x^2 - 8) \cos 4x dx;$

7. $\int \cos^2 3x \cdot \sin^2 4x dx;$

8. $\int \frac{\sqrt{2x-1}-1}{\sqrt{2x+1}} dx.$

Вариант №13

1. $\int \left(\frac{2}{1+x^2} - \frac{5}{4+x^2} - \frac{3}{\sqrt[6]{x}} \right) dx;$

2. $\int \frac{dx}{\sqrt{1-(8x)^2}};$

3. $\int \frac{\sqrt{4 \operatorname{tg} x - 1}}{\cos^2 x} dx;$

4. $\int \frac{4x}{\sqrt{x^2-x+2}} dx;$

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

6. $\int (2x-1)e^{4x} dx;$

7. $\int \frac{\sin x}{\cos x + 1} dx;$

8. $\int \frac{x dx}{\sqrt{x+1}-2} dx.$

Вариант №14

$$1. \int \left(\frac{3}{2+x^2} - 5x + 7e^x \right) dx;$$

$$3. \int \frac{(3\log_7 x - 2)^3}{x} dx;$$

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

$$7. \int \sin^3 x \cos^4 x dx;$$

$$2. \int 5^{4x-1} dx;$$

$$4. \int \frac{2x+1}{x^2-9x+2} dx;$$

$$6. \int (4x-8)\sin 8x dx;$$

$$8. \int \frac{\sqrt{x}-2}{\sqrt{x}+1} dx.$$

Вариант №15

$$1. \int \left(3\sin x - \frac{2}{\sqrt{1-x^2}} + \frac{3}{\sqrt{6-x^2}} \right) dx;$$

$$3. \int \frac{(4\arctg x - 3)^4}{1+x^2} dx;$$

$$5. \int \frac{x-1}{(x+8)(x-11)} dx;$$

$$7. \int \sin^3 4x \cos^3 4x dx;$$

$$2. \int 7^{5x-11} dx;$$

$$4. \int \frac{x-1}{\sqrt{x^2-6x+8}} dx;$$

$$6. \int (5x+8)\cos 3x dx;$$

$$8. \int \frac{\sqrt{x-1}-1}{\sqrt{x-1}+5} dx.$$

Вариант №16

$$1. \int \left(\frac{7}{4-x^2} + \frac{8}{4+x^2} - 2x \right) dx;$$

$$3. \int 2^{x^3} \cdot x^2 dx;$$

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

$$7. \int \sin 5x \cos 5x \sin 10x dx;$$

$$2. \int 3^{8x-1} dx;$$

$$4. \int \frac{3x-1}{\sqrt{x^2+6x+8}} dx;$$

$$6. \int \operatorname{arcctg} 3x dx;$$

$$8. \int \frac{x}{\sqrt{x}-1} dx.$$

Вариант №17

$$1. \int \left(3\cos x - 7\sin x - 2\sqrt[6]{x} + \frac{1}{x} \right) dx;$$

$$2. \int \frac{dx}{\cos^2(6x-3)};$$

$$3. \int \frac{e^x dx}{x^2};$$

$$5. \int \frac{x+8}{(x+3)(x+5)} dx;$$

$$7. \int \sin^5 3x dx;$$

$$4. \int \frac{x-8}{x^2+4x-6} dx;$$

$$6. \int \arcsin 8x dx;$$

$$8. \int \frac{dx}{\sqrt{x} + \sqrt[3]{x} + 2\sqrt[4]{x}} dx.$$

Вариант №18

$$1. \int \left(3 + 7^x - x^7 + \frac{8}{\sqrt[3]{x^2}} \right) dx;$$

$$3. \int x \sin 7x^2 dx;$$

$$5. \int \frac{x+8}{(x-3)(x+3)(x+1)} dx;$$

$$7. \int \sin^4 3x \cos 3x dx;$$

$$2. \int e^{8x-1} dx;$$

$$4. \int \frac{x-1}{\sqrt{x^2-6x-6}} dx;$$

$$6. \int e^{3x} \cdot x^3 dx;$$

$$8. \int \sqrt{\frac{1+x}{1-x}} dx.$$

Вариант №19

$$1. \int (2 \cos x - 3^x - 4^x \cdot 6^x + x^6) dx;$$

$$3. \int \frac{e^x dx}{1+e^{2x}};$$

$$5. \int \frac{x-8}{(x^2+5)(x+5)} dx;$$

$$7. \int \cos 2x \sin^2 6x dx;$$

$$2. \int \cos(12-11x) dx;$$

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

$$6. \int (4x-1)2^{3x} dx;$$

$$8. \int \frac{\sqrt{x-1}}{\sqrt{x-1}-1} dx.$$

Вариант №20

$$1. \int \left(\frac{2}{\sqrt{4+x^2}} - \frac{5}{\sqrt{5-x^2}} + \frac{7}{7+x^2} \right) dx;$$

$$2. \int \cos(8x-3) dx;$$

$$3. \int \frac{3^x}{x^2} dx;$$

$$5. \int \frac{7x}{(x-1)(x+6)} dx;$$

$$7. \int \frac{\cos x}{\sin x - \cos x} dx;$$

$$4. \int \frac{3x-1}{\sqrt{x^2-10x+1}} dx;$$

$$6. \int x^3 \log_4 x dx;$$

$$8. \int \frac{\sqrt{3x-1} dx}{\sqrt{3x-1}+4}.$$

Вариант №21

$$1. \int \left(\frac{3}{x} - \frac{6}{\sqrt{x}} + \frac{7}{\sqrt[3]{x}} - 2 \right) dx;$$

$$3. \int \frac{\sqrt{5 \ln x - 1}}{x} dx;$$

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

$$7. \int \cos^4 5x dx;$$

$$2. \int \frac{dx}{4-x};$$

$$4. \int \frac{x}{x^2+10x-2} dx;$$

$$6. \int (x^3-1) \ln x dx;$$

$$8. \int \frac{dx}{\sqrt[4]{x+1} - \sqrt{x+1}}.$$

Вариант №22

$$1. \int \left(\frac{2}{x^6} - \frac{3}{x^2} + 7\sqrt[3]{x} \right) dx;$$

$$3. \int \frac{3 \operatorname{tg} x - 4}{\cos^2 x} dx;$$

$$5. \int \frac{x^2}{(x^2+10)(x-1)} dx;$$

$$7. \int \sin^5 3x dx;$$

$$2. \int \frac{dx}{\cos^2(7x-3)};$$

$$4. \int \frac{x+2}{\sqrt{x^2+12x-8}} dx;$$

$$6. \int (4x-1) \cos x dx;$$

$$8. \int \frac{dx}{\sqrt[3]{x} - \sqrt[4]{x}}.$$

Вариант №23

$$1. \int \left(\frac{2}{\sqrt[3]{x}} - 3\sqrt{\frac{1}{x}} + 7^x - 1 \right) dx;$$

$$2. \int \frac{dx}{\sin^2(6x-1)};$$

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

4. $\int \frac{x-8}{x^2+6x+20} dx;$

5. $\int \frac{x^2-11}{(x-1)(x+1)(x+2)} dx;$

6. $\int (x+8)e^{3x} dx;$

7. $\int \sin^2 4x \cdot \cos 3x dx;$

8. $\int \frac{\sqrt[3]{x}-1}{\sqrt{x}-1} dx.$

Вариант №24

1. $\int (3\cos x - 6x + 8x^{10}) dx;$

2. $\int \frac{dx}{4-3x};$

3. $\int \sin x \sqrt[5]{5\cos+1} dx;$

4. $\int \frac{2x}{\sqrt{x^2-4x-20}} dx;$

5. $\int \frac{2x-1}{(x-1)(x+8)} dx;$

6. $\int (7x+8)\cos 11x dx;$

7. $\int \frac{\sin}{1+\cos^3 t} dx;$

8. $\int \frac{dx}{1+\sqrt{5x-4}}.$

Вариант №25

1. $\int (3\sin x - 2e^x + e \cdot 3^x - 11) dx;$

2. $\int \frac{dx}{6+(8x)^2};$

3. $\int x^3 e^{x^4} dx;$

4. $\int \frac{3x+6}{x^2-8x} dx;$

5. $\int \frac{x}{(x-1)(x+10)} dx;$

6. $\int (5x-11)e^{3x} dx;$

7. $\int \sin x \cos x \sin 6x dx;$

8. $\int \frac{x}{\sqrt{3x+1}-2} dx.$

Вариант №26

1. $\int \left(\frac{3}{x\sqrt{x}} - 7 \cdot 3^x + 3 \cdot 7^x - \cos x\right) dx;$

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

3. $\int \frac{dx}{x\sqrt[3]{2\ln x-4}};$

4. $\int \frac{3x+8}{x^2-6x+1} dx;$

5. $\int \frac{x}{(x-8)(x+8)(x+3)} dx;$

6. $\int x \cos^2 x dx;$

7. $\int \sin^2 2x dx;$

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

Вариант №27

1. $\int \left(\frac{3}{\sin^2 x} - \frac{6}{\cos^2 x} - \frac{2}{x} + 2^x \right) dx;$

2. $\int \sin(11x + 8) dx;$

3. $\int x^3 \cos(2x^4 + 1) dx;$

4. $\int \frac{x}{\sqrt{7-x^2-2x}} dx;$

5. $\int \frac{x+1}{(x-8)(x+2)} dx;$

6. $\int \operatorname{arctg} \sqrt{x} dx;$

7. $\int \sin^2 3x \cos^2 3x dx;$

8. $\int \frac{2\sqrt{x}-1}{\sqrt[3]{x+1}} dx.$

Вариант №28

1. $\int \left(\frac{3}{1-x^2} + \frac{6}{1+x^2} - \frac{7}{\sqrt[6]{x}} \right) dx;$

2. $\int 2^{6x-2} dx;$

3. $\int \cos x \sqrt{\sin x} dx;$

4. $\int \frac{2x-4}{\sqrt{3-x^2+6x}} dx;$

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

6. $\int (7x-1) \cos x dx;$

7. $\int \cos^3 5x dx;$

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

Вариант №29

1. $\int \left(\frac{2}{x} - 3^x + 7 \cos x - \sqrt[16]{x^3} \right) dx;$

2. $\int e^{3x+1} dx;$

3. $\int \sin x (3 \cos x - 1)^4 dx;$

4. $\int \frac{7x-1}{x^2+x+5} dx;$

5. $\int \frac{7x+2}{(x-1)(x+8)} dx;$

6. $\int x^2 e^{-x} dx;$

7. $\int \sin 8x \cos 3x dx;$

8. $\int \frac{\sqrt{x}}{\sqrt{x+1}} dx.$

Вариант №30

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

$$3. \int x^2 \sin(3x^3 - 4) dx;$$

$$5. \int \frac{x}{(x-1)(x+11)} dx;$$

$$7. \int \sin 6x \cos^2 x dx;$$

$$2. \int \cos(3x - 2) dx;$$

$$4. \int \frac{3x+1}{x^2 - 20x + 2} dx;$$

$$6. \int x \cdot 3^x dx;$$

$$8. \int \frac{dx}{\sqrt{x} - \sqrt[3]{x}}.$$