

7. Производные

1. В задачах 1 – 6 вычислить y' ; в задачах 7 – 8 вычислить y' и y'' для функции $y(x)$, заданной неявно; в задаче 9 вычислить y'' ; в задаче 10 вычислить $\frac{dy}{dx}$ и $\frac{d^2y}{dx^2}$, если функция $y(x)$ задана параметрически.

Вариант 1.

$$1. y = (3x^4 - 4/\sqrt[3]{x^5} + 2)^5.$$

$$6. y = (\operatorname{arctg} x)^{(\ln \operatorname{arctg} x)/2}.$$

$$2. y = \ln \sqrt[5]{\left(\frac{1-5x}{1+5x}\right)^3}.$$

$$7. x^2 + y^2 - \sqrt{x^2 + y^2} = 0.$$

$$3. y = \arccos 2x + \sqrt{1-4x^2}.$$

$$8. x \cdot \sin 2y - y \cdot \cos 2x = 10.$$

$$4. y = 2^{\operatorname{tg} x} + x \cdot \sin 2x.$$

$$9. y = \ln(x + \sqrt{x^2 + 1}).$$

$$5. y = \frac{2^{\operatorname{arctg} \sqrt{x}}}{\log_5 x}.$$

$$10. \begin{cases} x = \cos \ln t; \\ y = \sin^2 t. \end{cases}$$

Вариант 2.

$$1. y = (5x^2 - 2\sqrt[3]{x} + 3)^3.$$

$$6. y = (\sin x)^{5e^x}.$$

$$2. y = \ln \sqrt[6]{\frac{1-x^6}{1+x^6}}.$$

$$7. \ln x + \ln y = xy.$$

$$3. y = \operatorname{arctg} \sqrt{x^2 - 1}.$$

$$8. (e^y \cdot x - y)^2 = x^3 + 2.$$

$$4. y = e^{3x} - 2x \cdot \arcsin 5x.$$

$$9. y = \frac{x^2 + x}{x - 1}.$$

$$5. y = \frac{\cos(\ln x)}{\sqrt{\sin 3x}}.$$

$$10. \begin{cases} x = \arcsin(\sin t); \\ y = \arccos(\cos t). \end{cases}$$

Вариант 3.

1. $y = (7x^5 + 5/\sqrt[3]{x} - 13)^5.$

2. $y = \ln \sqrt[4]{\frac{4x-3}{2+x^3}}.$

3. $y = \arccos \sqrt{2x^2 - 3}.$

4. $y = 3^{\sin x} - \cos x \cdot \operatorname{tg}^5 x.$

5. $y = \frac{2^{\ln(x^2-1)}}{\operatorname{ctg}^2 4x}.$

6. $y = (\ln x)^{3x}.$

7. $x^4 + y^4 = 4xy.$

8. $x \cdot \ln y + y^2 \cdot e^x = x + 1.$

9. $y = \frac{x^2}{(x-2)^2}.$

10. $\begin{cases} x = \sqrt{2t - t^2}; \\ y = \arcsin(t - 1). \end{cases}$

Вариант 4.

1. $y = \frac{\sqrt{x} - 3x^3 + 2}{x^2}.$

2. $y = \ln \sqrt{\frac{x^4 - 5}{3 + x^4}}.$

3. $y = \operatorname{arctg} \sqrt{x^3} + \cos 3x.$

4. $y = e^{\sqrt{x}} + \operatorname{ctg} x^3 \cdot \sin 4x.$

5. $y = \frac{\sqrt[3]{\operatorname{tg} 2x}}{\arcsin e^x}.$

6. $y = (x/\operatorname{tg} x)^{e^{\cos x}}.$

7. $x^3 - 2x^2y^2 + 5x + y - 5 = 0.$

8. $y \cdot x^2 + \cos y = 2^y \cdot x.$

9. $y = \operatorname{arctg}(1/x).$

10. $\begin{cases} x = \ln \cos t; \\ y = \sin t. \end{cases}$

Вариант 5.

1. $y = (\sqrt[5]{x^2} + 3/x^5 - 1)^3.$

2. $y = \ln \sqrt[3]{\left(\frac{3x+5}{x^3+1}\right)^2}.$

3. $y = \log_3(2x+5)^5 + 2^{\cos x}.$

4. $y = \sin \sqrt{x} + \operatorname{tg}^5 x \cdot \cos 6x.$

5. $y = \frac{\log_3(x^2-1)}{\operatorname{arccctg} 4x^2}.$

6. $y = (\operatorname{ctg} 3x)^{2e^x}.$

7. $\frac{y^3}{x} + 2x \cdot y - \operatorname{tgy} = 0.$

8. $x - y = \arcsin x - \arcsin y.$

9. $y = \arcsin \sqrt{x}.$

10.
$$\begin{cases} x = 1/\ln t; \\ y = \ln \frac{1 + \sqrt{1-t^2}}{t}. \end{cases}$$

Вариант 6.

1. $y = \frac{4\sqrt[3]{x} - x^5 + 4x}{x}.$

2. $y = \ln \sqrt[5]{\frac{1-3x}{x^3+1}}.$

3. $y = \arcsin^3(2-x).$

4. $y = \cos^3 x \cdot \operatorname{ctg} 5x + (1/2)^x.$

5. $y = \frac{\sin(e^{x^2+3x-2})}{\operatorname{arctg} 2^x}.$

6. $y = (\operatorname{tg} x)^{4e^x}.$

7. $\sin(xy) + \cos(xy) = 0.$

8. $3/y^3 - y \cdot \sin x = x \cdot y$

9. $y = \ln(x^2 + x + 1).$

10.
$$\begin{cases} x = \ln \sqrt{\frac{1-t}{1+t}}; \\ y = \sqrt{1-t^2}. \end{cases}$$

Вариант 7.

1. $y = (3x^3 + x\sqrt{x} - 2/x)^5.$

6. $y = (\sin \sqrt{x})^{1/e^x}.$

2. $y = \frac{(x-2)^5 \cdot (2x+1)^3}{\sqrt[3]{1-x}}.$

7. $y \cdot x^2 + 2y = 2x.$

3. $y = \operatorname{arctg}(1-2x)^2.$

8. $x^4 + y^4 = x^2 y^2.$

4. $y = \sin^2 x \cdot \operatorname{tg} 3x - \log_5 7x.$

9. $y = \frac{x+2}{x^2-x}.$

5. $y = \frac{x e^{ctgx}}{10^{1-\sin^4 x}}.$

10.
$$\begin{cases} x = \sqrt{1-t^2}; \\ y = \frac{t}{\sqrt{1-t^2}}. \end{cases}$$

Вариант 8.

1. $y = \sqrt[5]{(7x^2 + 3\sqrt{x} - 2)^2}.$

6. $y = (x^4 + 5)^{\operatorname{ctgx}}.$

2. $y = \ln \sqrt[3]{\frac{1-x^2}{x^3-6x}}.$

7. $y - x^2 = \operatorname{arctg} y.$

3. $y = \arccos \sqrt{3x^5}.$

8. $e^x \sin y - e^y \cos x = 0.$

4. $y = 5^{x^4} + \ln^3 x \cdot \arcsin 2x^2.$

9. $y = \frac{2-x^2}{x^2+1}.$

5. $y = \frac{10^{2x-3}}{\ln(\sin 5x)^5}.$

10.
$$\begin{cases} x = \operatorname{arctg} t; \\ y = \ln \frac{\sqrt{1+t^2}}{t+1}. \end{cases}$$

Вариант 9.

$$1. y = \left(x\sqrt{x} - \frac{3}{x^5} + 2 \right)^3.$$

$$2. y = \ln^4 \sqrt{\frac{3x^2 + 2}{x^3 + 2x}}.$$

$$3. y = \operatorname{arctg}^5 \sqrt{x}.$$

$$4. y = 3^{\cos x} + \frac{1 - \sin 7x}{\operatorname{tg} 5x}.$$

$$5. y = \frac{\operatorname{sh}(e^x)}{\log_2(\cos x)}.$$

$$6. y = x^{e^{\sin x}}.$$

$$7. e^y + 7^y \cdot x^2 = 2x \cdot y^3.$$

$$8. y = x \cdot \ln(y^2 + 1).$$

$$9. y = x \cdot e^{-x}.$$

$$10. \begin{cases} x = t \cdot \sqrt{t^2 + 1}; \\ y = \ln \frac{1 + \sqrt{1 + t^2}}{t}. \end{cases}$$

Вариант 10.

$$1. y = (4x^7 + \sqrt[5]{2x^3} - 7x)^4.$$

$$2. y = \ln \sqrt{\frac{3 + x^2}{x^3 + 9x}}.$$

$$3. y = \log_3^2(5 - 4x^5).$$

$$4. y = e^{\operatorname{tg} x} - \sqrt{x} \cdot \cos 2x^3.$$

$$5. y = \frac{x \cdot 2^x}{\operatorname{arctg} \sqrt{1 - 2x^2}}.$$

$$6. y = x^{\arcsin x}.$$

$$7. 2^y + y \cdot x^2 - y^3 \cdot \sin x = 2.$$

$$8. x^3 + \ln y - x^2 e^y = 0.$$

$$9. y = \sqrt{x^2 + 2x + 3}.$$

$$10. \begin{cases} x = (1 + \cos^2 t); \\ y = \frac{\cos t}{\sin^2 t}. \end{cases}$$

Вариант 11.

$$1. y = \sqrt{\frac{4x^5 - x^2}{x^3} - \frac{2x}{3}}.$$

$$2. y = \ln \sqrt[3]{\frac{2x^2 - 2}{x^3 - 3x}}.$$

$$3. y = \arcsin 3x - \sqrt{1 - 9x^2}.$$

$$4. y = 3^{\sqrt{x}-2} + x \cdot \sin^3 x.$$

$$5. y = \frac{\arctg(x/a)}{\operatorname{tg}^2(\cos x)}.$$

$$6. y = (\sin x)^{5x/2}.$$

$$7. \ln(x+y) - x^2 + 3y = 0.$$

$$8. e^x + e^y - 2^{xy} - 1 = 0.$$

$$9. y = x \cdot \sqrt{1 - x^2}.$$

$$10. \begin{cases} x = \arccos(1/t); \\ y = \sqrt{t^{2-1}} + \arcsin(1/t). \end{cases}$$

Вариант 12.

$$1. y = \frac{6}{\sqrt{x^2 + 5x - 1}}.$$

$$2. y = \ln \sqrt[4]{\frac{4 + x^2}{x^3 + 12x}}.$$

$$3. y = \sqrt{\operatorname{tg} \frac{x}{2}} + 2^{\arctg x}.$$

$$4. y = 2x^3 \cdot \sin 5x + 5^{2x-7}.$$

$$5. y = \frac{\sqrt[5]{\arcsin x}}{\log_2(\cos x)}.$$

$$6. y = x^{e^{\arctg x}}.$$

$$7. \arctg y + e^{x \cdot y} = 2x.$$

$$8. \ln(x-y) = x^2 + y^2.$$

$$9. y = \sqrt{x^2 + 2x + 3}.$$

$$10. \begin{cases} x = \arctg \frac{t+1}{t-1}; \\ y = \arcsin \sqrt{1-t^2}. \end{cases}$$

Вариант 13.

$$1. y = \left(\frac{2x}{\sqrt{x}} - 9x^5 + 2 \right)^9.$$

$$2. y = \ln \sqrt[3]{\frac{3-x^2}{x^3-9x}}.$$

$$3. y = \arccos \frac{2}{x^2-1}.$$

$$4. y = \sqrt[3]{\sin 5x} - e^{\operatorname{tg} x} \cdot \cos x^5.$$

$$5. y = \frac{\cos \sqrt{x} - (1/2)^x}{\log_7 x^3}.$$

$$6. y = x^{2x} \cdot 5^x.$$

$$7. 3^{x+3y} + y \cdot \operatorname{ctg} x - 7 = 0.$$

$$8. x^2 \sin y + y^3 \cos x = 2x.$$

$$9. y = \frac{\sqrt{x+1}}{x^2}.$$

$$10. \begin{cases} x = \ln \operatorname{tg} t; \\ y = 1/\sin^2 t. \end{cases}$$

Вариант 14.

$$1. y = \left(4x^5 - \frac{7}{\sqrt[3]{x^2}} + 5 \right)^3.$$

$$2. y = \ln \sqrt[3]{\left(\frac{3x-4}{3x+1} \right)^4}.$$

$$3. y = \frac{\sqrt{x+1}}{\arccos^2 4x}.$$

$$4. y = e^{1-3x} + \sin x^2 \cdot \operatorname{tg} \sqrt{x}.$$

$$5. y = \frac{\operatorname{arctg}(3^{\operatorname{tg} 7x})}{\sqrt{\operatorname{ch} x}}.$$

$$6. y = (\operatorname{tg} x)^{\ln \operatorname{tg}(x/4)}.$$

$$7. y \cdot x^3 - x + \cos y - 2 = 0.$$

$$8. x \cdot \sin y + y \cdot \cos x = 0.$$

$$9. y = \frac{x+2}{\sqrt{x+1}}.$$

$$10. \begin{cases} x = \operatorname{ctg} t \operatorname{tg} t; \\ y = 1/\cos^2 t. \end{cases}$$

Вариант 15.

1. $y = \left(9x\sqrt{x} + \frac{5}{x^7} - 1 \right)^6.$

6. $y = x^{e^{\operatorname{tg} x}}.$

2. $y = \ln \sqrt[6]{\left(\frac{x^6 - 1}{6x + 5} \right)^7}.$

7. $y \cdot \ln 3 - x \sin y + x^2 = 0.$

3. $y = 3^{\sin x} + \operatorname{arctg}^3 \sqrt{x}.$

8. $y^3 \cdot x^3 - 3xy - 2 = 0.$

4. $y = \cos^3 x + e^4 \cdot \log_2(x^5 - 1).$

9. $y = \operatorname{arctg} x^2.$

5. $y = \frac{\operatorname{sh}^3 e^x}{\log_5(\operatorname{arcsin} 2x)}$

10. $\begin{cases} x = t^2 + 2t; \\ y = \ln \sin t. \end{cases}$

Вариант 16.

1. $y = \sqrt[4]{(9x^5 + 7\sqrt{x} - e)^3}.$

6. $y = x^{3x} \cdot 2^x.$

2. $y = \frac{(x+5)^3 \cdot (3-2x)^4}{(6x-10)^5}.$

7. $0,5 \cdot y \cdot x = \operatorname{tgy} - \log_2 x.$

3. $y = \log_5 x + \arccos \sqrt{3x-4}.$

8. $\sin(y-x) = \ln(y-x^2) + 2.$

4. $y = x \cdot \sin^5 x + 7^{2-x}.$

9. $y = e^{2x} \cdot \sin 3x.$

5. $y = \frac{\sqrt[3]{\operatorname{ctg} 5x}}{e^{\operatorname{sh} 2x-1}}.$

10. $\begin{cases} x = \sqrt{t^2 + 1}; \\ y = \ln(t + \sqrt{t^2 + 1}). \end{cases}$

Вариант 17.

1. $y = \frac{17}{(x^3 - 29x^2 + 21x - 12)^5} \cdot$
6. $y = (\sin^2 x / \sqrt{x})^{x+1}.$
2. $y = \frac{\sqrt[5]{2-3x}}{(3x+1)^7 \cdot (5-4x)^3} \cdot$
7. $x \cdot \operatorname{ctgy} = \sqrt{y} - 3x^2.$
3. $y = \sqrt[5]{\operatorname{arctg}^3 7x} - \sqrt{3-5x^2}.$
8. $y^x - x^y = \cos x.$
4. $y = 3^{\sin x} - \sqrt[5]{x^2} \cdot \log_3^2 x.$
9. $y = e^{-x} \cdot \cos 2x.$
5. $y = \frac{\operatorname{th}(\ln x)}{\sqrt{1 - \arcsin 6x}}.$
10. $\begin{cases} x = \sqrt{t^2 + 1}; \\ y = \ln(1 + e^t). \end{cases}$

Вариант 18.

1. $y = \frac{\sqrt[3]{x^2} - 7x^3 - 13}{\sqrt{x}} \cdot$
6. $y = (\operatorname{tg} x)^{\operatorname{ctg}^2 x}.$
2. $y = \ln \sqrt{\frac{1-x^2}{x^3-3x}}.$
7. $\operatorname{arctg} \frac{y}{x} = \ln \sqrt{x^2 + y^2}.$
3. $y = \arccos \sqrt{x/4} + e^2.$
8. $\frac{x}{y} + \frac{y}{x} = e^x.$
4. $y = e^{\operatorname{tg} x} + \operatorname{ctg} 2x \cdot \sin^3 x.$
9. $y = x \cdot \ln(x^2 + 1).$
5. $y = \frac{\operatorname{cth}(10^{1-\sin x})}{\log_3 \sqrt{x^5}}.$
10. $\begin{cases} x = \arcsin^2 t; \\ y = t \cdot \ln t. \end{cases}$

Вариант 19.

$$1. y = \frac{32}{(3x^5 - 16\sqrt{x} + 12x - 1)^4}.$$

$$2. y = \ln \sqrt{\left(\frac{6x-3}{6x+2}\right)^3}.$$

$$3. y = \frac{\operatorname{arctg}^2 x}{\sqrt{x}}.$$

$$4. y = \operatorname{tg}^2 3x + \sqrt{\sin x} \cdot \cos 4x^3.$$

$$5. y = \frac{e^{\sqrt{\ln(ax^2 + bx + c)}}}{\operatorname{sh}(\arccos x)}.$$

$$6. \ln \sqrt{e^{y/2}} = \arcsin x - \cos y.$$

$$7. \frac{xy^2 - 4x}{3y} = 6x.$$

$$8. y = (x \cdot \sin x)^{8 \ln(x \cdot \sin x)}.$$

$$9. y = x \cdot e^{x^2}.$$

$$10. \begin{cases} x = \sqrt{2t - t^2}; \\ y = 1/\sqrt[3]{(t-1)^2}. \end{cases}$$

Вариант 20.

$$1. y = \left(2x^4 + \frac{\sqrt{x}}{x} - 9x - 2\right)^5.$$

$$2. y = \frac{\sqrt[3]{(3x-8)^2}}{(5x-3)^7 \cdot (4-7x)^5}.$$

$$3. y = \frac{1-x}{\arcsin^3 2x}.$$

$$4. y = \operatorname{tg} 4x - 5^{\cos x} \cdot \operatorname{arcctg}^2 x.$$

$$5. y = \frac{\log_9(\operatorname{ctg} 5x)}{x \cdot e^{\arccos x}}.$$

$$6. y = (\operatorname{ctg} 3x)^{2e^x}.$$

$$7. y \cdot \sin 6x - \lg y = 5x - 2^x.$$

$$8. x \cdot y = \operatorname{arctg} \frac{y}{x}.$$

$$9. y = (x^2 + 1) \cdot \operatorname{arctg} x.$$

$$10. \begin{cases} x = \arcsin^2 t; \\ y = t/\sqrt{1-t^2}. \end{cases}$$

Вариант 21.

1. $y = (0,5 \cdot \sqrt[3]{x^2} + 5/x^3 + 7)^2$.
2. $y = \ln \frac{(2x-3)(3x+2)}{x^5}$.
3. $y = \sqrt{\log_2(7x-4)} + 3^{\sin x}$.
4. $y = \cos x^2 + \sqrt{\operatorname{tg} x} \cdot e^{6x}$.
5. $y = \frac{\sqrt[3]{x} \cdot (3-x^3)}{\operatorname{arctg} x}$.
6. $y = x^{e^{\operatorname{ctg} x}}$.
7. $\frac{x^3}{\sqrt{y}} + x \cdot \sin y - \operatorname{tgy} = 0$.
8. $y = 19^{x^{19}} \cdot x^{19}$.
9. $y = \frac{2x}{x^2 + 4}$.
10. $\begin{cases} x = \arcsin \sqrt{1-t^2}; \\ y = \arccos^2 t. \end{cases}$

Вариант 22.

1. $y = \frac{3\sqrt[3]{x} - 5x^3 + 7x}{x^2}$.
2. $y = \ln \sqrt[5]{\frac{(1-3x)^5}{3x^2-2}}$.
3. $y = \arccos(x+2)^3$.
4. $y = \cos^3 x \cdot \operatorname{ctg} x + 2^{2 \sin x}$.
5. $y = \frac{e^2 \cdot e^{x^2+3x-2}}{\operatorname{arctg} 2^x}$.
6. $y^2 + \ln y = e^x + x^2$.
7. $\ln 2 \cdot y^3 - \operatorname{tgy} \cdot \cos x = x/y$.
8. $\sqrt[3]{x^2} + \sqrt[3]{y^2} = \sqrt[3]{a^2}$.
9. $y = \frac{x^2 + 1}{x + 3}$.
10. $\begin{cases} x = \arcsin \sqrt{t}; \\ y = \sqrt{1 + \sqrt{t}}. \end{cases}$

Вариант 23.

1. $y = 7\sqrt[5]{x^3} + x\sqrt{x} - 2/x^5.$

2. $y = \frac{(3x+2)^7 \cdot \sqrt{(2x+5)^3}}{\sqrt[3]{1-x}}.$

3. $y = \operatorname{arccotg}^2(2-x).$

4. $y = \sin^2 x \cdot \operatorname{tg} 3x - \log_5 7x.$

5. $y = \frac{x \cdot \operatorname{ctgx}}{8^{\sin 3x}}.$

6. $y = (\arcsin x)^{e^{\sqrt{1-x^2}}}.$

7. $y \cdot x^2 + 2 \ln e \cdot y = x - \cos y.$

8. $2^x + 2^y = 2^{xy}.$

9. $y = x \cdot e^{-x^2}.$

10. $\begin{cases} x = \operatorname{arctge}^t; \\ y = \sqrt{e^t + 1}. \end{cases}$

Вариант 24.

1. $y = (0,5x^2 + 3\sqrt{x} - 2/x)^2.$

2. $y = \ln \frac{(1-x)^2}{(x^3 - 6x)(7x+3)}.$

3. $y = \arccos 5x^2.$

4. $y = 2^{x^3} + \ln x^5 \cdot \arcsin x^2.$

5. $y = \frac{2^{7x-5}}{\ln(\sin^5 x)}.$

6. $y = (x^3 + 4)^{\operatorname{tg} x}.$

7. $y - \ln 5 \cdot \cos x = \operatorname{arctgy}.$

8. $x^3 + y^3 - 3x \cdot y = 0.$

9. $y = \ln^2(x+1).$

10. $\begin{cases} x = \ln(1-t^2); \\ y = \arcsin \sqrt{1-t^2}. \end{cases}$

Вариант 25.

$$1. y = \sqrt{x \cdot \sqrt{x} - \frac{3}{x^5}} + 2.$$

$$2. y = \ln \frac{(3x^2 + 2) \cdot \sqrt{x}}{(x^3 + 2)^2}.$$

$$3. y = \operatorname{arctg}^7 \sqrt{x}.$$

$$4. y = (1/3)^x + \frac{7 - \sin x^2}{\operatorname{tg} 3x}.$$

$$5. y = \frac{e^{\operatorname{ctgx}}}{\lg \sqrt{10x}}.$$

$$6. y = (\arcsin x)^{e^x}.$$

$$7. e^x + 7^y \cdot \cos x = y/3.$$

$$8. x^4 - 6x^2y^2 + 9y^4 = 0.$$

$$9. y = \left(\frac{x-2}{x+1} \right)^2.$$

$$10. \begin{cases} x = (3t^2 + 1)/3t^2; \\ y = \sin(t^3/3 + t). \end{cases}$$

Вариант 26.

$$1. y = (4x^7 + \sqrt[3]{x^2} - 7x) \cdot \sqrt[3]{x}.$$

$$2. y = \ln \sqrt[3]{\frac{(3+x^2)^3}{x^3+9x}}.$$

$$3. y = \lg(5 - 4x^5).$$

$$4. y = e^{\operatorname{ctgx}} - \sqrt{x} \cdot \sin 3x^2.$$

$$5. y = \frac{\operatorname{tg} x \cdot 2^x}{\operatorname{arctg} \sqrt{1-2x^2}}.$$

$$6. y = (x^3 - 1)^{\sin x}.$$

$$7. 2^y \cdot x^2 - \sqrt{y} \cdot \cos x = 2 \ln 3.$$

$$8. \cos(x+y) = x \cdot y.$$

$$9. y = \frac{x^2}{x-1}.$$

$$10. \begin{cases} x = \ln \frac{1}{\sqrt{1-t^4}}; \\ y = \arcsin \frac{1-t^2}{\sqrt{1+t^2}}. \end{cases}$$

Вариант 27.

$$1. y = \left(\frac{4x^5 - x^2}{x^3} - \frac{2x}{3} \right) \cdot x.$$

$$2. y = \ln \sqrt[5]{\frac{2x^3 + 9}{x^3 - 3x}}.$$

$$3. y = \arcsin 3x - \sqrt{1 + 0,5x^2}.$$

$$4. y = 3^{x^3 - 2} + x / \sin x.$$

$$5. y = \frac{\arctg(x/4)}{\tg(\cos^2 x)}.$$

$$6. y = (\cos 5x)^{e^x}.$$

$$7. \ln(x + y) - y^2 + 3x = 0.$$

$$8. Ax^2 + 2Bxy + Cy^2 + 2Dy = 0.$$

$$9. y = \sin^3 x.$$

$$10. \begin{cases} x = \operatorname{ctg}(2e^t); \\ y = \ln tge^t. \end{cases}$$

Вариант 28.

$$1. y = \frac{6}{(x^2 + 5x - 1)^5}.$$

$$2. y = \ln \sqrt[4]{\frac{4 + x^2}{x^3 + 12x}}.$$

$$3. y = \sqrt{\operatorname{tg} x^2} + 2^{\ln x}.$$

$$4. y = 2x^3 \cdot \cos 4x + 3^{5x-2}.$$

$$5. y = \frac{\sqrt[5]{\arcsin x}}{\log_2(\sin x)}.$$

$$6. y = (\sin x)^{e^{\sqrt{x}}}.$$

$$7. \operatorname{arctg} y + e^{x \cdot y} = 2x.$$

$$8. 2y \cdot \ln x = x - y.$$

$$9. y = \operatorname{arctg}^2 x.$$

$$10. \begin{cases} x = \ln(t + \sqrt{t^2 + 1}); \\ y = t\sqrt{t^2 + 1}. \end{cases}$$

Вариант 29.

1. $y = \left(\frac{2x}{\sqrt{x}} + 0,5x^5 + 2 \right) \cdot \sqrt{x}.$
2. $y = \ln \sqrt[3]{\frac{(3-x^2)(x-2)}{x^3-8}}.$
3. $y = \arccos^3(x-1).$
4. $y = \sqrt[3]{\sin 5x} - e^{\operatorname{tg} x} \cdot \cos x^5.$
5. $y = \frac{\operatorname{arctg} 8x + 2^x}{\log_7 x}.$
6. $y = x^{e^{\arcsin x}}.$
7. $3^{3x-y} + x \cdot \operatorname{ctgy} - 0,3 = 0.$
8. $\ln(x+y) = x-y.$
9. $y = (\ln x)/x^2.$
10. $\begin{cases} x = \cos^3 t; \\ y = \sin^3 t. \end{cases}$

Вариант 30.

1. $y = \left(4\sqrt{x} - \sqrt[3]{x^2} + 3x \right)^5.$
2. $y = \ln \sqrt[3]{\left(\frac{3x-4}{3x+1} \right)^4}.$
3. $y = \frac{x+3}{\arccos^2 4x}.$
4. $y = e^{1-2x} + \sin^3 x \cdot \operatorname{tg} x.$
5. $y = \frac{\operatorname{arctg}(3^{7x})}{\lg x^5}.$
6. $y = \left(\frac{\cos^2 x}{1+2x} \right)^{\sin x}.$
7. $y/x - x + \cos y^2 - \ln e = 0.$
8. $x^4 + y^4 = 4xy.$
9. $y = x \cdot \ln(x^2 + 1).$
10. $\begin{cases} x = \operatorname{arccost}; \\ y = \ln(t^2 + 1). \end{cases}$