

ДОМАШНА РАБОТА №2

1) Пресметнете производната на функцията:

$$1.1. y = 4x^3 + 3x^2 - 5x + 3;$$

$$1.2. y = 5x^5 + 2x^3 - 5x^2 - 15;$$

$$1.3. y = 7x^6 - 8x^4 - 6x - 1;$$

$$1.4. y = 5x^8 - 3x^4 - 5x^2 + 9;$$

$$1.5. y = 3x^8 - 2x^6 + 5x^3 - 9;$$

$$1.6. y = 2x^{10} + x^8 + 3x - 10;$$

$$1.7. y = x^{12} - 3x^8 + 6x - 5;$$

$$1.8. y = x^{15} - 4x^6 - 5x^4 - 8;$$

$$1.9. y = 4x^{10} - 3x^7 + 4x - 11;$$

$$1.10. y = 5x^{12} + 4x^{10} - 7x^2 + 6.$$

2) Пресметнете производната на функцията:

$$2.1. y = \sqrt[3]{x^2} + \frac{6}{x} - \frac{4}{x^3} - \sqrt[5]{x};$$

$$2.2. y = \sqrt[4]{x^3} - \frac{8}{x} + \frac{5}{x^4} - \sqrt[6]{x};$$

$$2.3. y = \sqrt[5]{x^3} + \frac{10}{x} - \frac{9}{x^2} - \sqrt[8]{x};$$

$$2.4. y = \sqrt[4]{x^5} + \frac{10}{x^4} - \frac{2}{\sqrt{x}} - \sqrt[3]{x};$$

$$2.5. y = \sqrt[5]{x^4} - \frac{8}{x^3} - \frac{6}{\sqrt{x}} - \sqrt[5]{x};$$

$$2.6.; y = \sqrt[3]{x^7} - \frac{8}{x^2} - \frac{6}{\sqrt[3]{x}} - \sqrt{x^5};$$

$$2.7. y = \sqrt[4]{x^9} - \frac{6}{x^5} - \frac{8}{\sqrt[4]{x}} - \sqrt{x^3};$$

$$2.8. y = \sqrt[3]{x^8} - \frac{6}{x} + \frac{10}{\sqrt[5]{x}} - \sqrt{x^7};$$

$$2.9. y = \sqrt[4]{x^7} - \frac{9}{x} + \frac{12}{\sqrt[4]{x}} - \sqrt{x^9};$$

$$2.10. y = \sqrt[5]{x^6} - \frac{8}{x^3} + \frac{9}{\sqrt[3]{x}} - \sqrt{x^{11}}.$$

3) Пресметнете производната на функцията:

$$3.1. y = 3^x + 6\operatorname{tg}x - 4e^x + 5\sin x;$$

$$3.2. y = 4^x + 6\operatorname{cot}g x - 4\ln x + 5\cos x;$$

$$3.3. y = 5^x - 6\cos x + 9\ln x + 4\arccos x;$$

$$3.4. y = 6^x - 8\ln x + 4\cos x - 5\arcsin x;$$

$$3.5. y = 7^x + 8e^x + 4\operatorname{tg}x + 6\operatorname{arctg}x;$$

$$3.6. y = 8^x + 6\operatorname{cot}g x - 5e^x + 6\ln x;$$

$$3.7. y = 9^x + 6\cos x - 7e^x + 5\ln x;$$

$$3.8. y = 10^x - 7\cos x - 7\operatorname{arc cot} gx + 5\operatorname{tg}x;$$

$$3.9. y = 2^x - 9\ln x - 5\cos x + 8\arcsin x;$$

$$3.10. y = 11^x - 9e^x - 5\operatorname{tg}x - \operatorname{arctg}x.$$

4) Пресметнете производната на функцията:

$$4.1. y = (3^x + x^3 - 3x) \cdot \sin x;$$

$$4.2. y = (x^5 - 3x - 2) \cdot \cos x;$$

$$4.3. y = (x^5 - 3x^2 - 8) \cdot \ln x;$$

$$4.4. y = (x^6 - 5) \cdot \arcsin x;$$

$$4.5. y = \sqrt[3]{x} \cdot \operatorname{arctg}x;$$

$$4.6. y = \sqrt{x^3} \cdot \operatorname{cot}g x;$$

$$4.7. y = (\sqrt{x} + 3) \cdot e^x;$$

$$4.8. y = (\sqrt[4]{x} + 2x) \cdot \operatorname{tg} x;$$

$$4.9. y = \left(x^3 - \frac{1}{x^3}\right) \cdot \arccos x;$$

$$4.10. y = \left(x^2 - \frac{1}{x}\right) \cdot \operatorname{arccot} g x.$$

5) Пресметнете производната на функцията:

$$5.1. y = \frac{x^2 - 5}{x^2 + 4};$$

$$5.2. y = \frac{x^2 - 7}{x^2 + 3};$$

$$5.3. y = \frac{3x^2 - 7}{2x^2 + 3};$$

$$5.4. y = \frac{2x^2 + 3}{3x^2 + 2};$$

$$5.5. y = \frac{x^2 - 7x - 1}{x^2 + 1};$$

$$5.6. y = \frac{x^2 + x - 9}{x^2 + 2};$$

$$5.7. y = \frac{x^2 - 7}{x^2 + 2x + 3};$$

$$5.8. y = \frac{x^2 + 4}{x^2 - 4x + 6};$$

$$5.9. y = \frac{3x - 5}{x^2 + 5};$$

$$5.10. y = \frac{4x + 3}{x^2 + 6}.$$

6) Пресметнете производната на функцията:

$$6.1. y = \sin(x^2 + 5);$$

$$6.2. y = e^{x^3 - 5x + 4};$$

$$6.3. y = \cos(x^4 + 5x);$$

$$6.4. y = \operatorname{arctg}(3x^2);$$

$$6.5. y = \ln(x^3 - 6x - 1);$$

$$6.6. y = \operatorname{arccot} g(2x^5);$$

$$6.7. y = \operatorname{tg}(x^6 + x - 3);$$

$$6.8. y = \arccos(2x^8);$$

$$6.9. y = \operatorname{cot} g(x^4 + x^2 - 1);$$

$$6.10. y = \arcsin(3x + 1).$$

7) Пресметнете производната на функцията:

$$7.1. y = (x^4 + 5x - 3)^8;$$

$$7.2. y = (x^{10} - 5)^6;$$

$$7.3. y = (x^7 - 3x^2 + 4)^{10};$$

$$7.4. y = (x^6 + 3x)^5;$$

$$7.5. y = \frac{1}{(x^4 + 6)^4};$$

$$7.6. y = \frac{1}{(x^2 + 6x + 10)^3};$$

$$7.7. y = \sqrt{x^4 + 4x + 9};$$

$$7.8. y = \sqrt[3]{x^4 + 2};$$

$$7.9. y = \frac{1}{\sqrt{2x^6 + 1}};$$

$$7.10. y = \frac{1}{\sqrt[3]{x^3 - 2}}.$$

8) Пресметнете производната на функцията:

$$8.1. y = \sqrt{\frac{x-3}{x^2+1}};$$

$$8.2. y = \sqrt{\frac{2x-3}{3x+5}};$$

$$8.3. y = \sqrt[3]{\frac{2x-1}{3x+7}};$$

$$8.4. y = \sqrt[4]{\frac{2x^2-3}{x^2+7}};$$

$$8.5. y = \sqrt[5]{\frac{3x-5}{x+6}};$$

$$8.6. y = \sqrt[7]{\frac{2x-3}{x^3+7}};$$

$$8.7. y = \left(\frac{2x+5}{4x-1}\right)^5;$$

$$8.8. y = \left(\frac{3x-7}{2x+8}\right)^7;$$

$$8.9. y = \left(\frac{4x+2}{3x-5}\right)^6;$$

$$8.10. y = \left(\frac{x^2+2}{x-1}\right)^8.$$

9) Пресметнете производната на функцията:

$$9.1. y = \arcsin^2(x^2-3);$$

$$9.2. y = \operatorname{tg}^4(x^3+1);$$

$$9.3. y = \operatorname{arctg}^3\left(\frac{3}{x}\right);$$

$$9.4. y = \cos^3\left(\frac{x}{5}\right);$$

$$9.5. y = \operatorname{arccos}^4\left(\frac{4}{x^3}\right);$$

$$9.6. y = \sin^6\left(\frac{x^3}{3}\right);$$

$$9.7. y = \operatorname{arccotg}^6\left(\frac{5}{x^4}\right);$$

$$9.8. y = \operatorname{cotg}^2\left(\frac{x^4}{2}\right);$$

$$9.9. y = \ln^8(x^4+2x+5);$$

$$9.10. y = \cos^5(x^5+x-2).$$

10) Пресметнете производната на функцията:

$$10.1. y = \operatorname{tg}(x^4+3)^5;$$

$$10.2. y = \ln(x^4+2x^2+5)^8;$$

$$10.3. y = \cos(x^5-1)^3;$$

$$10.4. y = \arcsin\sqrt{x^4+5};$$

$$10.5. y = \sin(x^4-3x-1)^7;$$

$$10.6. y = \operatorname{arctg}\sqrt{2x+3};$$

$$10.7. y = \operatorname{cotg}(x^4-x-1)^6;$$

$$10.8. y = \operatorname{arccotg}\sqrt{x^6+x^2+1};$$

$$10.9. y = e^{(x^3+5)^4};$$

$$10.10. y = \operatorname{arccos}\sqrt{x^2+7}.$$

11) Пресметнете производната на функцията:

$$11.1. y = \cotg^4 x + \cotg x^4 - \cotg^4 x^4;$$

$$11.3. y = \tg^2 x + \tg x^2 - \tg^2 x^2;$$

$$11.5. y = \sin^7 x + \sin x^7 - \sin^7 x^7;$$

$$11.7. y = \cos^3 x + \cos x^3 - \cos^3 x^3;$$

$$11.9. y = \tg^6 x + \tg x^6 - \tg^6 x^6;$$

$$11.2. y = \operatorname{arccotg}^5 x + \operatorname{arccotg} x^5 - \operatorname{arccotg}^5 x^5;$$

$$11.4. y = \operatorname{arctg}^3 x + \operatorname{arctg} x^3 - \operatorname{arctg}^3 x^3;$$

$$11.6. y = \operatorname{arcsin}^8 x + \operatorname{arcsin} x^8 - \operatorname{arcsin}^8 x^8;$$

$$11.8. y = \operatorname{arccos}^4 x + \operatorname{arccos} x^4 - \operatorname{arccos}^4 x^4;$$

$$11.10. y = \operatorname{arccotg}^2 x + \operatorname{arccotg} x^2 - \operatorname{arccotg}^2 x^2.$$

12) Пресметнете производната на функцията:

$$12.1. y = (x^3 + 5) \cdot \arccos^3 \left(\frac{4}{x^3} \right);$$

$$12.3. y = \sqrt{x^6 + 3} \cdot \sin \left(\frac{2x-1}{x+3} \right);$$

$$12.5. y = \sqrt{\frac{x^2+3}{x^2+1}} \cdot \arcsin \left(\frac{2}{x} \right);$$

$$12.7. y = (x^5 - 3x)^4 \cdot e^{\sqrt{x+3}};$$

$$12.9. y = \sqrt[3]{5^x - x^5 - 5x} \cdot \tg^4 x;$$

$$12.2. y = (x^4 - 3x + 2) \cdot \arcsin^4 \left(\frac{6}{x^2} \right);$$

$$12.4. y = \sqrt[3]{3x+5} \cdot \cos \left(\frac{3x+4}{2x+5} \right);$$

$$12.6. y = \sqrt{\frac{x^4-5}{x^4+2}} \cdot \operatorname{arctg} \left(\frac{3}{x^2} \right);$$

$$12.8. y = (x^4 + 2x - 1)^3 \cdot \tg \sqrt{2x+1};$$

$$12.10. y = \sqrt[4]{4^x - x^4 + 4x} \cdot \ln^3(2x+5).$$

13) Пресметнете производната на функцията:

$$13.1. y = (x^2 + 4)^x;$$

$$13.3. y = (\cos x)^x;$$

$$13.5. y = x^{x^2+3};$$

$$13.7. y = (\cotg x)^x;$$

$$13.9. y = (\cos x)^{2x+1};$$

$$13.2. y = x^{x^3};$$

$$13.4. y = (\sin x)^x;$$

$$13.6. y = (\tg x)^x;$$

$$13.8. y = (\sin x)^{x^3};$$

$$13.10. y = (\tg x)^{2x^2+3}.$$