**Задача 10**. Найти производную.

10.1. 

y'= 1 \*2-√5thx\*√5/ch2x\*(2-√5thx)+ √5/ch2x\*(2+√5thx) =

4√5 2+√5thx (2-√5thx)2

= 1 \_

ch2x(2-√5thx)

10.2. 

y'= ch5x-4ch3xsh2x + 3ch3x-6chxsh2x + 3chx = 1 + 3-3sh2x + 3 \_

4ch8x 8ch4x 8(1+sh2x) 4ch5x 8ch3x 8chx

10.3. 

1-√(thx) + 1+√(thx) \_

y'= 1/2\* 1-√(thx) \* 2√(thx)ch2x 2√(thx)ch2x \_ 1 =

1+√(thx) (1-√(thx))2 2√(thx)ch2x

= √thx \_

(1-th2x)(ch2x)

10.4. 

√2-thx + √2+thx 2-th2x + 2th2x

y'= 3 \*√2-thx \* ch2x ch2x \_ ch2x ch2x =

8√2 √2+thx (√2-thx)2  4(2-th2x)2

= 1 \_

2ch2x(2-th2x)2

10.5. 

y'= 1 + 1-√2thx \* √2(1-√2thx+1+√2thx) =

2ch2x 4√2(1+√2thx) ch2x(1-√2thx)2

= 1-th2x \_

ch2x(1-√2thx)2

10.6. 

y'= \_ 1 \_ sh3x-2shxch2x = 2ch3x+2chx-sh2x

4thxch2x 2sh4x 4sh3xchx

10.7. 

y'= a-√(1+a2)thx \* √(1+a2)thx(a-√(1+a2)thx+a+√(1+a2)thx) =

2a√(1+a2)(a+√(1+a2)thx) (a-√(1+a2)thx)2

= thx = thx = thx \_

(a2-(1+a2)th2x)ch2x a2ch2x-(1+a2)sh2x a2-sh2x

10.8. 

y'= 1-√2cthx \* √2(-1+√2cthx+1+√2cthx) = √2cthx =

18√2(1+√2cthx) sh2x(1-√2cthx)2 9sh2x(1-√2cthx)

= -√2cthx \_

9(1+ch2x)

10.9. 

y'= 1 \* ch2x/√(sh2x)-√(sh2x)(shx-chx) =

1+sh2x/(shx-chx)2  chx-shx

= (chx-shx)(ch2x-sh2x(shx-chx))

√(sh2x)(ch2x+sh2x)

10.10. 

y'= 2+sh2x \* -ch2x(2+sh2x)-ch2x(1-sh2x) = ch2x \_

6(1-sh2x) (2+sh2x)2 12-6sh2x-sh22x

10.11. 

y'= 4√(1-thx)3  \* 1-thx+1+thx = 1 \_

44√(1+thx)3 ch2x(1-thx) 4ch2x√(1+thx) 4√(1-th2x)

10.12. 

y'= chx(1+chx)-sh2x = 1 \_

(1+chx)2 1+chx

10.13. 

y'= shx√(sh2x)-chxch2x/√(sh2x) = shx-chxcth2x

sh2x

10.14. 

y'= 3ch3x√(ch6x)-3sh6xsh3x/√(ch6x) = 3sh3x-3th6xsh3x

ch6x

10.15. 

y'= 16shxch3x\*ln(chx)+8ch3xshx-16ch3xshxln(chx) = 4thx

2ch4x

10.16. 

y'= 2shxchx(12sh2x+1)-24sh3xchx = 4chx

3sh4x 3sh3x

10.17. 

y'= 2chxsh2x-ch3x + 3 = shx-1 + 3 \_

2ch4x ch2x√(1-th2x) 2ch3x ch2x√(1-th2x)

10.18. 

y'= 1 \* shx(1+3chx)-3shx(3+chx) =

√8√(1-(3+chx)2/(1+3chx)2) (1+3chx)2

= -8shx = -1 \_

8(1+3chx)√(ch2x-1) 1+3chx

10.19. 

y'= 4-√8th(x/2) \* √8(4-√8th(x/2)+4+√8th(x/2)) =

√8(4+√8th(x/2)) 2ch2(x/2)(4-√8th(x/2))2

= 1 \_

ch2(x/2)(4-√8th(x/2))

10.20. 

y'= 1 \_ shx(sh2x-3chx-ch2x) = 1+chx \_

8ch2(x/2)th(x/2) 4sh2x(3+chx) shx(3+chx)

10.21. 

y'= -(3+5chx)(3shx(3+5chx)-5shx(5+3chx)) = 1

4(3+5chx)2√(9+30chx+25ch2x-25-30chx-9ch2x)

10.22. 

y'= -16ch5xshx-4ch3x(1-8ch2x) = -4ch2xshx-1+8ch2x

4ch8x ch5x

10.23. 

y'= -2/sh2x+1/sh4x+ch3x-2chxsh2x+ 5chx = -2/sh2x+1/sh4x+1-sh2x+ 5\_

2ch4x 2+2sh2x 2ch3x 2chx

10.24. 

y'= -16 + sh4x+3sh2xch2x = 1-4sh2x

3sh22x 3ch2xsh6x ch2xsh4x

10.25. 

y'= chx \_ 1-sh2x = 1 \_ 1-sh2x

2+2sh2x 2ch3x 2ch2x 2ch3x

10.26. 

y'= 3 + shx – sh3x-2shxch2x = 1+sh2x

4ch2(x/2)th(x/2) 2sh4x shx

10.27. 

y'= 2chxsh2x-ch3x + 2shxchx \_ 3chx = sh2x-1 + 2chx \_ 3 \_

2ch4x sh4x 2+2sh2x 2ch3x sh3x 2chx

10.28. 

y'= ch3x-2chxsh2x + chx = 1 \_

2ch4x 2+2sh2x ch3x

10.29. 

y'= ch3x-2chxsh2x + chx = 1 \_

2ch4x 2+2sh2x ch3x

10.30. 

y'= 2ch2xshx-sh3x \_ 1 = 1/sh3x

2sh4x 4ch2(x/2)th(x/2)

10.31. 

y'= -2 \_ sh4x-3ch2xsh2x = 1/sh4x

3sh2x 3sh6x