

Таблица производных сложных функций

1. $(u^n)' = n u^{n-1} \cdot u'$
2. $\left(\frac{1}{u}\right)' = -\frac{1}{u^2} \cdot u'$
3. $(\sqrt{u})' = \frac{1}{2\sqrt{u}} \cdot u'$
4. $(\ln u)' = \frac{1}{u} \cdot u', (u > 0)$
5. $(\log_a u)' = \frac{1}{u \ln a} \cdot u', a > 0, a \neq 1, u > 0$
6. $(e^u)' = e^u \cdot u'$
7. $(a^u)' = a^u \ln a \cdot u', a > 0, a \neq 1$
8. $(\sin u)' = \cos u \cdot u'$
9. $(\cos u)' = -\sin u \cdot u'$
10. $(\operatorname{tg} u)' = \frac{1}{\cos^2 u} \cdot u'$
11. $(\operatorname{ctg} u)' = -\frac{1}{\sin^2 u} \cdot u'$
12. $(\operatorname{arctg} u)' = \frac{1}{1+u^2} \cdot u'$
13. $(\operatorname{arcctg} u)' = -\frac{1}{1+u^2} \cdot u'$
14. $(\operatorname{arcsin} u)' = \frac{1}{\sqrt{1-u^2}} \cdot u'$
15. $(\operatorname{arccos} u)' = -\frac{1}{\sqrt{1-u^2}} \cdot u'$

Правила дифференцирования

1. $(cu)' = c \cdot u',$
2. $(u \pm v)' = u' \pm v'$
3. $(u \cdot v)' = u' \cdot v + v' \cdot u$
4. $\left(\frac{u}{v}\right)' = \frac{u' \cdot v - v' \cdot u}{v^2}$

Таблица интегралов

1. $\int du = u + c$
2. $\int u^n du = \frac{u^{n+1}}{n+1} + c$
3. $\int \frac{du}{u^2} = -\frac{1}{u} + c$
4. $\int \frac{du}{\sqrt{u}} = 2\sqrt{u} + c$
5. $\int \frac{du}{u} = \ln|u| + c$
6. $\int e^u du = e^u + c$
7. $\int a^u du = \frac{a^u}{\ln a} + c$
8. $\int \sin u du = -\cos u + c$
9. $\int \cos u du = \sin u + c$
10. $\int \frac{du}{\cos^2 u} = \operatorname{tg} u + c$
11. $\int \frac{du}{\sin^2 u} = -\operatorname{ctg} u + c$
12. $\int \frac{du}{a^2 + u^2} = \frac{1}{a} \operatorname{arctg} \frac{u}{a} + c$
13. $\int \frac{du}{a^2 - u^2} = -\frac{1}{a} \operatorname{arcctg} \frac{u}{a} + c$
14. $\int \frac{du}{\sqrt{a^2 - u^2}} = \operatorname{arcsin} \frac{u}{a} + c$
15. $\int \frac{du}{u^2 - a^2} = \frac{1}{2a} \ln \left| \frac{u-a}{u+a} \right| + c$
16. $\int \frac{du}{a^2 - u^2} = \frac{1}{2a} \ln \left| \frac{u+a}{u-a} \right| + c$
17. $\int \frac{du}{\sqrt{u^2 \pm a}} = \ln \left| u + \sqrt{u^2 \pm a} \right| + c$

Свойства интегралов

1. $\int d(F(x)) = F(x) + c$
2. $\left(\int f(x) dx\right)' = f(x)$
3. $\int cf(x) dx = c \int f(x) dx$
4. $\int (f(x) \pm \varphi(x)) dx = \int f(x) dx \pm \int \varphi(x) dx$