Таблица основных дифференциалов

1. $dx = \frac{1}{a} d(ax) = \frac{1}{a} d(ax + b)$, где a и b — некоторые числа.

В частности, $dx = \frac{1}{2} d(2x) = \frac{1}{2} d(2x + b) = \frac{1}{3} d(3x) = \frac{1}{3} d(3x + b)$ и так далее.

2. $x^{\alpha} dx = \frac{1}{\alpha+1} d(x^{\alpha+1}) = \frac{1}{\alpha+1} d(x^{\alpha+1} + b), \alpha \neq -1$.

В частности, $xdx = \frac{1}{2} d(x^2) = \frac{1}{2} d(x^2 + b) = \frac{1}{2a} d(a x^2 + b)$,

$x^2 dx = \frac{1}{3} d(x^3) = \frac{1}{3} d(x^3 + b) = \frac{1}{3a} d(a x^3 + b)$, $\frac{dx}{x^2} = -d\left(\frac{1}{x}\right) = -d\left(\frac{1}{x} + b\right)$,

$\frac{dx}{x^3} = -\frac{1}{2} d\left(\frac{1}{x^2}\right) = -\frac{1}{2} d\left(\frac{1}{x^2} + b\right)$,

$\frac{dx}{\sqrt{x}} = 2d(\sqrt{x}) = 2d(\sqrt{x} + b)$.

3. $\frac{dx}{x} = d(\ln x) = d(\ln x + b) = \frac{1}{a} d(a \ln x + b)$.

4. $e^x dx = d(e^x) = d(e^x + b)$, $e^{\alpha x} dx = \frac{1}{\alpha} d(e^{\alpha x}) = \frac{1}{\alpha} d(e^{\alpha x} + b)$.

5. $\cos x dx = d \sin x = d(\sin x + b)$.

$\cos \alpha x dx = \frac{1}{\alpha} d \sin \alpha x = \frac{1}{\alpha\beta} d(\beta \sin \alpha x + b)$.

6. $\sin x dx = -d \cos x = -d(\cos x + b)$.

$\sin \alpha x dx = -\frac{1}{\alpha} d \cos \alpha x = -\frac{1}{\alpha\beta} d(\beta \cos \alpha x + b)$.

7. $\frac{dx}{\cos^2 x} = d\mathrm{tg} x = d(\mathrm{tg} x + b)$.

$\frac{dx}{\cos^2 \alpha x} = \frac{1}{\alpha} d\mathrm{tg} \alpha x = \frac{1}{\alpha\beta} d(\beta \mathrm{tg} \alpha x + b)$.

8. $\frac{dx}{\sin^2 x} = -d\mathrm{ctg} x = -d(\mathrm{ctg} x + b)$.

$\frac{dx}{\sin^2 \alpha x} = -\frac{1}{\alpha} d\mathrm{ctg} \alpha x = -\frac{1}{\alpha\beta} d(\beta \mathrm{ctg} \alpha x + b)$.

9. $\frac{dx}{1 + x^2} = d(\mathrm{arctg}\, x) = -d(\mathrm{arcctg}\, x)$.

$\frac{dx}{1 + \alpha^2 x^2} = \frac{1}{\alpha} d(\mathrm{arctg}\, \alpha x) = \frac{1}{\alpha\beta} d(\beta \mathrm{arctg}\, \alpha x) = -\frac{1}{\alpha\beta} d(\beta \mathrm{arcctg} \alpha x)$.

10. $\frac{dx}{\sqrt{1 - x^2}} = d(\arcsin x) = -d(\arccos x)$.

$\frac{dx}{\sqrt{1 - \alpha^2 x^2}} = \frac{1}{\alpha} d(\arcsin \alpha x) = \frac{1}{\alpha\beta} d(\beta \arcsin \alpha x) = = -\frac{1}{\alpha} d(\arccos \alpha x) = -\frac{1}{\alpha\beta} d(\beta \arccos \alpha x)$.

$df(x) = \frac{1}{a} d(af(x)) = \frac{1}{a} d(af(x) + b)$.