

جدول مشتق تابع

ردیف	تابع	مشتق تابع	نمونه
1	$y = k$	$y' = k$	$y = 7 \rightarrow y' = 0$ $y = -\frac{r}{r} \rightarrow y' = 0$
2	$y = kx$	$y' = k$	$y = 7x \rightarrow y' = 7$ $y = x \rightarrow y' = 1$ $y = -x \rightarrow y' = -1$
3	$y = x^n$	$y' = nx^{n-1}$	$y = x^5 \rightarrow y' = 5x^4$
4	$y = ku$	$y' = ku'$	$y = 7x^r \rightarrow y' = r \cdot 7x^{r-1}$
5	$y = u \pm v$	$y' = u' \pm v'$	$y = 7x^r - 5x^r + x - 1$ $\rightarrow y' = r \cdot 7x^{r-1} - 1 \cdot 5x^{r-1} + 1$
6	$y = u^n$	$y' = nu'u^{n-1}$	$y = (x^r - x + 1)^5$ $\rightarrow y' = 5 \cdot (r \cdot x^{r-1} - 1) \cdot (x^r - x + 1)^4$
7	$y = uv$	$y' = u'v + v'u$	$y = (3x + 1)(x^r + x)$ $\rightarrow y' = r(3x + 1)(x^{r-1} + 1) + (3x + 1)(r \cdot x^{r-1} + 1)$
8	$y = \frac{u}{v}$	$y' = \frac{u'v - v'u}{v^2}$	$y = \frac{3x - 1}{x^r + x} \rightarrow$ $y' = \frac{r(x^r + x) - (3x - 1)(r \cdot x^{r-1} + 1)}{(x^r + x)^2}$
9	$y = \frac{ax + b}{cx + d}$	$y' = \frac{ad - bc}{(cx + d)^2}$	$y = \frac{7x - 1}{3x + 4} \rightarrow$ $y' = \frac{r \cdot 4 - (-r)}{(3x + 4)^2} = \frac{r \cdot 5}{(3x + 4)^2}$
10	$y = \sqrt{u}$	$y' = \frac{u'}{2\sqrt{u}}$	$y = \sqrt{x} \rightarrow y' = \frac{1}{2\sqrt{x}}$ $y = \sqrt{7x + 1} \rightarrow y' = \frac{7}{2\sqrt{7x + 1}}$

11	$y = \sqrt[n]{u^m}$	$y' = \frac{mu'}{n\sqrt[n]{u^{n-m}}}$	$y = \sqrt[r]{1+x^r} \rightarrow y' = \frac{1(r x^{r-1})}{r\sqrt[r]{(1+x^r)^r}}$
12	$y = u $	$y' = \frac{u'u}{ u }$	$y = x \rightarrow y' = \frac{x}{ x }$ $y = x^r - 1 \rightarrow y' = \frac{rx(x^{r-1} - 1)}{ x^r - 1 }$
13	$y = \sin u$	$y' = u' \cos u$	$y = \sin x \rightarrow y' = \cos x$ $y = \sin(x^r - x) \rightarrow y' = (rx - 1)\cos(x^r - x)$
14	$y = \cos u$	$y' = -u' \sin u$	$y = \cos x \rightarrow y' = -\sin x$ $y = \cos \sqrt{x} \rightarrow y' = \frac{-1}{\sqrt{x}} \sin \sqrt{x}$
15	$y = \tan u$	$y' = u'(1 + \tan^r u)$	$y = \tan x \rightarrow y' = 1(1 + \tan^r x)$ $y = \tan(x^r + 1) \rightarrow y' = rx^{r-1}(1 + \tan^r(x^r + 1))$
16	$y = \cot u$	$y' = -u'(1 + \cot^r u)$	$y = \cot x \rightarrow y' = -(1 + \cot^r x)$ $y = \cot(rx + 1) \rightarrow y' = -r(1 + \cot^r(rx + 1))$
17	$y = e^u$	$y' = u'e^u$	$y = e^x \rightarrow y' = e^x$ $y = e^{\sin x} \rightarrow y' = \cos x e^{\sin x}$
18	$y = \ln u$	$y' = \frac{u'}{u}$	$y = \ln x \rightarrow y' = \frac{1}{x}$ $y = \ln(rx^r - x + 1) \rightarrow y' = \frac{rx - 1}{rx^r - x + 1}$
19	$y = a^u \left(\begin{matrix} a > 1 \\ a \neq 1 \end{matrix} \right)$	$y' = u'(\ln a)a^u$	$y = \delta^{\sqrt{x}} \rightarrow y' = \frac{1}{\sqrt{x}} \ln \delta (\delta^{\sqrt{x}})$
20	$y = u^v$	$y' = \left(v' \ln u + \frac{u'}{u} v \right) u^v$	$y = (x^r - x)^{vx+1} \rightarrow$ $y' = \left(v \ln(x^r - x) + \frac{rx - 1}{x^r - x} (vx + 1) \right) (x^r - x)^{vx+1}$

21	$y = \log_a^u$	$y' = \frac{u'}{u \ln a}$	$y = \log_{\delta}^{(x^r - x)} \rightarrow y' = \frac{rx - 1}{(x^r - x) \ln \delta}$
22	$y = \sin^{-1} u$	$y' = \frac{u'}{\sqrt{1 - u^r}}$	$y = \sin^{-1}(\delta x^r - 1) \rightarrow y' = \frac{1 \cdot x}{\sqrt{1 - (\delta x^r - 1)^r}}$
23	$y = \cos^{-1} u$	$y' = \frac{-u'}{\sqrt{1 - u^r}}$	$y = \cos^{-1}(rx - 1) \rightarrow y' = \frac{-(r)}{\sqrt{1 - (rx - 1)^r}}$
24	$y = \tan^{-1} u$	$y' = \frac{u'}{1 + u^r}$	$y = \tan^{-1} \sqrt{x} \rightarrow y' = \frac{\frac{1}{2}\sqrt{x}}{1 + (\sqrt{x})^r}$
25	$y = \cot^{-1} u$	$y' = \frac{-u'}{1 + u^r}$	$y = \cot^{-1} x \rightarrow y' = \frac{-1}{1 + x^r}$