

## EJERCICIOS DE DERIVADAS

<u>FUNCIÓN</u>	<u>DERIVADA</u>
1.- $y=3$	$y'=0$
2.- $y=x+5$	$y'=1$
3.- $y=x^7$	$y'=7x^6$
4.- $y=x^6-x^3$	$y'=6x^5-3x^2$
5.- $y=2x^4$	$y'=8x^3$
6.- $y=ax+b$	$y'=a$
7.- $y=5x-2$	$y'=5$
8.- $y=a^5$	$y'=0$
9.- $y=ax^2+bx+c$	$y'=2ax+b$
10.- $y=x(x-1)$	$y'=2x-1$
11.- $y=(x+1)(x-1)$	$y'=2x$
12.- $y=ax^3+bx^2+cx+d$	$y'=3ax^2+2bx+c$
13.- $y=x^3-x^2+4x-5$	$y'=3x^2-2x+4$
14.- $y=x^4-4x^3+5x^2$	$y'=4x^3-12x^2+10x$
15.- $y=2x^3+3x^2-6x+5$	$y'=6x^2+6x-6$
16.- $y=(x+1)(x^2-x+3)$	$y'=3x^2+2$
17.- $y=x(x-1)^2$	$y'=3x^2-4x+1$
18.- $y=a(x-1)^2$	$y'=2a(x-1)$
19.- $y=a(a-1)^2$	$y'=0$
20.- $y=x^{-2}$	$y'=\frac{-2}{x^3}$
21.- $y=\frac{1}{x+1}$	$y'=\frac{-1}{(x+1)^2}$
22.- $y=\frac{x^2-3}{x^3+x}$	$y'=\frac{-x^4+10x^2+3}{(x^3+x)^2}$
23.- $y=\frac{x+1}{x}$	$y'=\frac{-1}{x^2}$
24.- $y=\frac{x(x+1)(x-1)}{3x^2-3}$	$y'=\frac{3x^4-6x^2+3}{(3x^2-3)^2}$
25.- $y=\frac{x(x+2)^2}{x^2+4x+4}$	$y'=1$
26.- $y=\sqrt{3x-2}$	$y'=\frac{3}{2\sqrt{3x-2}}$

27.-	$y = \sqrt{2x-1}$	$y' = \frac{1}{\sqrt{2x-1}}$
28.-	$y = \sqrt{x^2+1}$	$y' = \frac{x}{\sqrt{x^2+1}}$
29.-	$y = \sqrt{\frac{1-x}{1+x}}$	$y' = \frac{-1}{(1+x)^2 \sqrt{\frac{1-x}{1+x}}}$
30.-	$y = \frac{1-x}{\sqrt{1-x^2}}$	$y' = \frac{1}{(-1-x)\sqrt{1-x^2}}$
31.-	$y = e^{4x}$	$y' = 4e^{4x}$
32.-	$y = 5^{2x}$	$y' = 2 \cdot 5^{2x} \cdot \ln 5$
33.-	$y = e^{3-x^2}$	$y' = -2xe^{3-x^2}$
34.-	$y = \frac{e^x + e^{-x}}{2}$	$y' = \frac{e^x - e^{-x}}{2}$
35.-	$y = x^3 \cdot 2^x \cdot e^x$	$y' = x^2 \cdot 2^x \cdot e^x (3 + x \ln 2 + x)$
36.-	$y = \frac{e^x - e^{-x}}{e^x + e^{-x}}$	$y' = \frac{4}{(e^x + e^{-x})^2}$
37.-	$y = a^{x^2+x+1}$	$y' = (2x+1) \cdot a^{x^2+x+1} \cdot \ln a$
38.-	$y = \ln(x^2+1)$	$y' = \frac{2x}{x^2+1}$
39.-	$y = \ln(ax^2+bx+c)$	$y' = \frac{2ax+b}{ax^2+bx+c}$
40.-	$y = \ln^5 3x$	$y' = \frac{5 \ln^4 3x}{x}$
41.-	$y = x^5 \ln x$	$y' = x^4 (5 \ln x + 1)$
42.-	$y = x^2 \ln(2-x)$	$y' = x \left( 2 \ln(2-x) - \frac{x}{2-x} \right)$
43.-	$y = \frac{\ln x}{x}$	$y' = \frac{1 - \ln x}{x^2}$
44.-	$y = \lg_3(1+x^2)$	$y' = \frac{2x}{1+x^2} \log_3 e$
45.-	$y = \ln(x-5)$	$y' = \frac{1}{x-5}$
46.-	$y = \lg_a(3x^2+5)$	$y' = \frac{6x}{3x^2+5} \lg_a e$
47.-	$y = x \cdot \ln x - x$	$y' = \ln x$
48.-	$y = \ln \sqrt{1+x^2}$	$y' = \frac{x}{1+x^2}$

- 49.-  $y = \ln \sqrt{\frac{1-x}{1+x}}$   $y' = \frac{-1}{1-x^2}$
- 50.-  $y = \ln \frac{x^2+1}{x^2-1}$   $y' = \frac{-4x}{x^4-1}$
- 51.-  $y = \text{sen } 2x$   $y' = 2 \cos x$
- 52.-  $y = \cos(2x+1)$   $y' = -2 \text{sen}(2x+1)$
- 53.-  $y = \text{tg}(x^2+x+1)$   $y' = (2x+1) \sec^2(x^2+x+1)$
- 54.-  $y = \text{tg} \sqrt{x}$   $y' = \frac{1}{2\sqrt{x}} \sec^2 \sqrt{x}$
- 55.-  $y = \sec(3x^2+4x-1)$   $y' = (6x+4) \sec(3x^2+4x-1) \text{tg}(3x^2+4x-1)$
- 56.-  $y = \text{cosec} \frac{x}{a}$   $y' = \frac{-1}{a} \text{cosec} \frac{x}{a} \text{ctg} \frac{x}{a}$
- 57.-  $y = \sqrt{\text{sen } 3x}$   $y' = \frac{3 \cos 3x}{2\sqrt{\text{sen } 3x}}$
- 58.-  $y = \text{sen}^{2/3} x$   $y' = \frac{2}{3} \text{sen}^{-1/3} x \cdot \cos x = \frac{2 \cos x}{3\sqrt[3]{\text{sen } x}}$
- 59.-  $y = x \cos x$   $y' = \cos x - x \text{sen } x$
- 60.-  $y = \ln \text{sen } x$   $y' = \text{ctg } x$
- 61.-  $y = \text{sen } x \cdot \cos 2x$   $y' = \cos x \cdot \cos 2x - 2 \text{sen } x \cdot \text{sen } 2x$
- 62.-  $y = e^x \text{tg } x$   $y' = e^x (\text{tg } x + \sec^2 x) = e^x (\text{tg}^2 x + \text{tg } x + 1)$
- 63.-  $y = \arcsen 2x$   $y' = \frac{2}{\sqrt{1-4x^2}}$
- 64.-  $y = \arcsen \sqrt{x}$   $y' = \frac{1}{2\sqrt{1-x}\sqrt{x}} = \frac{1}{2\sqrt{x-x^2}}$
- 65.-  $y = \arccos(x^2+1)$   $y' = \frac{-2x}{\sqrt{1-(x^2+1)^2}}$
- 66.-  $y = \frac{1}{3} \text{tg}^3 x - \text{tg } x + x$   $y' = \text{tg}^2 x \cdot \sec^2 x - \sec^2 x + 1$
- 67.-  $y = \text{arctg} \frac{1+x}{1-x}$   $y' = \frac{1}{1+x^2}$
- 68.-  $y = \left( \frac{1-\text{sen } x}{1+\text{sen } x} \right)^2$   $y' = \frac{-4(1-\text{sen } x) \cos x}{(1+\text{sen } x)^3}$
- 69.-  $y = \ln \text{tg } x$   $y' = \frac{1}{\text{sen } x \cos x}$
- 70.-  $y = \ln \sqrt{\frac{1+\cos x}{1-\cos x}}$   $y' = -\text{cosec } x$
- 71.-  $y = \ln \sqrt{\text{sen } x}$   $y' = \text{ctg } 2x$

72.-  $y = \operatorname{arcsec} x^2$   $y' = \frac{2}{x\sqrt{x^4-1}}$

73.-  $y = \operatorname{arctg}(2x+1)$   $y' = \frac{-2}{(2x+1)^2+1}$

74.-  $y = \operatorname{sen}(\operatorname{sen} 2x)$   $y' = 2 \cos 2x \cdot \cos(\operatorname{sen} 2x)$

75.-  $y = \operatorname{sen}(\ln(3x+5))$   $y' = \frac{3}{3x+5} \cos(\ln(3x+5))$

76.-  $y = \operatorname{arcsen}(\cos x - x)$   $y' = \frac{-\operatorname{sen} x - 1}{\sqrt{1 - (\cos x - x)^2}}$

77.-  $y = \ln(x + \ln x)$   $y' = \frac{x+1}{x^2 + x \ln x}$

78.-  $y = \operatorname{arcsen}\left(\frac{1}{1+x^2}\right)$   $y' = \frac{-2}{(1+x^2)\sqrt{x^2+2}}$

79.-  $y = \lg\left(\frac{\lg x}{x}\right)$   $y' = \frac{\log e - \log x}{x \log x} \log e$

80.-  $y = \ln^{1/2} \operatorname{sen} 2x$   $y' = \frac{\operatorname{ctg} 2x}{\sqrt{\ln \operatorname{sen} 2x}}$

81.-  $y = x^2 \cos 3x$   $y' = 2x \cos 3x - 3x^2 \operatorname{sen} 3x$

82.-  $y = x^{x+1}$   $y' = \left[\ln x + \frac{x+1}{x}\right] x^{x+1}$

83.-  $y = \left(1 + \frac{1}{x}\right)^x$   $y' = \left[\ln \frac{x+1}{x} - \frac{1}{x-1}\right] \left(1 + \frac{1}{x}\right)^x$

84.-  $y = (x^5)^{x^2+1}$   $y' = \left[10x \ln x + \frac{5x^2+5}{x}\right] (x^5)^{x^2+1}$

85.-  $y = x^{e^x}$   $y' = \left[e^x \ln x + \frac{e^x}{x}\right] x^{e^x}$

86.-  $y = (3x+1)^{2x+3}$   $y' = \left[2 \ln(3x+1) + \frac{6x+9}{3x+1}\right] (3x+1)^{2x+3}$

87.-  $y = (\operatorname{sen} x)^x$   $y' = [\ln(\operatorname{sen} x) + x \operatorname{ctg} x] (\operatorname{sen} x)^x$

88.-  $y = x^{\operatorname{sen}(2x-9)}$   $y' = \left[2 \cos(2x-9) \ln x + \frac{\operatorname{sen}(2x-9)}{x}\right] x^{\operatorname{sen}(2x-9)}$

89.-  $y = (\operatorname{sen} x)^{\cos x}$   $y' = [-\operatorname{sen} x \ln(\operatorname{sen} x) + \cos x \operatorname{ctg} x] (\operatorname{sen} x)^{\cos x}$

90.-  $y = (\ln x)^{\ln x}$   $y' = \frac{1}{x} [\ln(\ln x) + 1] (\ln x)^{\ln x}$

91.-  $y = (x^2-1)^{\operatorname{sen} x}$   $y' = \left[\cos x \ln(x^2-1) + \frac{2x \operatorname{sen} x}{x^2-1}\right] (x^2-1)^{\operatorname{sen} x}$