

## DERIVADAS

Calcula la derivada de cada una de las siguientes funciones:

1.  $f(x) = (x^2 - 5x + 6)^4$

2.  $f(x) = \frac{1}{(x^2 + 1)^3}$

3.  $f(x) = x^3(2x^2 - 1)$

4.  $f(x) = \frac{1}{2x^2}$

5.  $f(x) = 3x - \sqrt[3]{x^2 - 9}$

6.  $f(x) = (3x^2 + 2)\sqrt{1 - 5x^2}$

7.  $f(x) = \frac{x}{\sqrt{4 - x^2}}$

8.  $f(x) = \sqrt{\frac{1-x}{1+x}}$

9.  $f(x) = \text{Ln } x^3$

10.  $f(x) = \text{Ln}\left(\frac{e^x}{1 - e^x}\right)$

11.  $f(x) = e^{x^4}$

12.  $f(x) = 2^{\text{Ln}(\cos x)}$

13.  $f(x) = \sqrt{e^{x^2}}$

14.  $f(x) = \text{sen } 2x$

15.  $f(x) = \sqrt{\text{sen } x}$

16.  $f(x) = \cos e^x$

17.  $f(x) = \text{cotg } x$

18.  $f(x) = \text{sec } x$

19.  $f(x) = \text{cosec } x$

20.  $f(x) = \cos^5 3x$

21.  $f(x) = \text{cosec } x^7$

22.  $f(x) = \arccos \sqrt{x}$

23.  $f(x) = \text{arctg}(\text{Ln } x)$

24.  $f(x) = \text{tg}^3 5x$

25.  $f(x) = \sec^5 7x$

26.  $f(x) = \arccos a^x$

27.  $f(x) = \text{cotg}(\text{sen } x)$

28.  $f(x) = \text{tg} \sqrt{x^2 - 1}$

29.  $f(x) = a^{\sqrt{\frac{x+1}{x-1}}}$

30.  $f(x) = \text{Ln}\left(\frac{\text{Ln } x}{x}\right)$

31.  $f(x) = \sqrt{e^{(x^2-1)}}$

32.  $f(x) = \text{sen} \sqrt{1 + e^x}$

33.  $f(x) = \text{Ln}(x \cdot e^{x^2})$

34.  $f(x) = a^x \cdot x^a$

35.  $f(x) = 5^x \cdot e^{2x}$

36.  $f(x) = e^x \cdot \text{Ln } x$

37.  $f(x) = \text{Ln}[(\text{Ln } x)^3]$

38.  $f(x) = \text{Ln}(\text{sen } x^2)$

39.  $f(x) = \text{sen}(\text{arcsen } x)$

40.  $f(x) = e^{\text{cosec } x}$

41.  $f(x) = \text{Ln}(\text{tg}^2 3x)$

42.  $f(x) = e^{\text{arctg}(x+1)}$

43.  $f(x) = \text{sen}[\text{arctg}(x^2 + 1)]$

44.  $f(x) = \text{Ln}[\arccos(\text{sen } x)]$

45.  $f(x) = \text{Ln}(\cos x) + x \cdot e^{2x}$

46.  $f(x) = x^x$

47.  $f(x) = x^{\text{Ln } x}$

48.  $f(x) = (\text{sen } x)^x$

49.  $f(x) = x^{\text{sen } x}$

50.  $f(x) = x^{e^x}$

51.  $f(x) = (\text{arctg } x)^x$

*Solución:*

1.  $f'(x) = 4(x^2 - 5x + 6)^3(2x - 5)$

2.  $f'(x) = \frac{-6x}{(x^2 + 1)^4}$

3.  $f'(x) = 10x^4 - 3x^2$

4.  $f'(x) = \frac{-1}{x^3}$

5.  $f'(x) = 3 - \frac{2x}{3\sqrt[3]{(x^2 - 9)^2}}$

6.  $f'(x) = 6x\sqrt{1-5x^2} - \frac{15x^3 + 10x}{\sqrt{1-5x^2}}$

7.  $f'(x) = \frac{4}{(\sqrt{4-x^2})^3}$

8.  $f'(x) = \frac{-1}{\sqrt{(1-x)(1+x)^3}}$

9.  $f'(x) = \frac{3}{x}$

10.  $f'(x) = \frac{1}{1-e^x}$

11.  $f'(x) = 4x^3 e^{x^4}$

12.  $f'(x) = -2^{\ln(\cos x)} \cdot \operatorname{tg} x \cdot \ln 2$

13.  $f'(x) = \frac{x \cdot e^{x^2}}{\sqrt{e^{x^2}}}$

14.  $f'(x) = 2 \cos 2x$

15.  $f'(x) = \frac{\cos x}{2\sqrt{\sin x}}$

16.  $f'(x) = -e^x \cdot \operatorname{sen} e^x$

17.  $f'(x) = -1 - \operatorname{cotg}^2 x = -\operatorname{cosec}^2 x$

18.  $f'(x) = \operatorname{sen} x \cdot \operatorname{sec}^2 x$

19.  $f'(x) = -\cos x \cdot \operatorname{cosec}^2 x$

20.  $f'(x) = -15x \cdot \cos^4 3x \cdot \operatorname{sen} 3x$

21.  $f'(x) = -7x^6 \cdot \cos x^7 \cdot \operatorname{cosec}^2 x^7$

22.  $f'(x) = \frac{-1}{2\sqrt{x} \cdot \sqrt{1-x}}$

23.  $f'(x) = \frac{1}{x \cdot (1 + (\ln x)^2)}$

24.  $f'(x) = 15 \operatorname{tg}^2 5x \cdot (1 + \operatorname{tg}^2 5x)$

25.  $f'(x) = 35 \operatorname{sen} 7x \cdot \operatorname{sec}^6 7x$

26.  $f'(x) = \frac{-a^x \cdot \ln a}{\sqrt{1-a^{2x}}}$

27.  $f'(x) = -(\cos x) \cdot [\operatorname{cosec}^2(\operatorname{sen} x)]$

28.  $f'(x) = \frac{x \cdot (1 + \operatorname{tg}^2 \sqrt{x^2 - 1})}{\sqrt{x^2 - 1}}$

29.  $f'(x) = \frac{-a^{\sqrt{\frac{x+1}{x-1}}} \cdot \ln a}{\sqrt{(x+1) \cdot (x-1)^3}}$

30.  $f'(x) = \frac{1 - \ln x}{x \cdot \ln x}$

31.  $f'(x) = x \cdot \sqrt{e^{(x^2-1)}}$

32.  $f'(x) = \frac{e^x \cdot \cos \sqrt{1+e^x}}{2\sqrt{1+e^x}}$

33.  $f'(x) = \frac{1+2x^2}{x}$

34.  $f'(x) = a^x \cdot x^{a-1} \cdot (x \cdot \ln a + a)$

35.  $f'(x) = 5^x \cdot e^{2x} \cdot (2 + \ln 5)$

36.  $f'(x) = e^x \cdot \left( \ln x + \frac{1}{x} \right)$

37.  $f'(x) = \frac{3}{x \cdot \ln x}$

38.  $f'(x) = 2x \cdot \operatorname{cotg} x^2$

39.  $f'(x) = \frac{\cos(\operatorname{arcsen} x)}{\sqrt{1-x^2}}$

40.  $f'(x) = -\cos x \cdot \operatorname{cosec}^2 x \cdot e^{\operatorname{cosec} x}$

41.  $f'(x) = 6(\operatorname{cotg} 3x + \operatorname{tg} 3x)$

42.  $f'(x) = \frac{e^{\operatorname{arctg}(x+1)}}{1+(x+1)^2}$

43.  $f'(x) = \frac{2x \cdot \cos(\operatorname{arctg}(x^2+1))}{1+(x^2+1)^2}$

44.  $f'(x) = -1/\operatorname{arccos}(\operatorname{sen} x)$

45.  $f'(x) = -\operatorname{tg} x + e^{2x} \cdot (1+2x)$

46.  $f'(x) = x^x \cdot [\ln x + 1]$

47.  $f'(x) = (x^{\ln x}) \cdot 2 \ln x / x$

48.  $f'(x) = (\operatorname{sen} x)^x \cdot [\ln(\operatorname{sen} x) + x \cdot \operatorname{cotg} x]$

49.  $f'(x) = x^{\operatorname{sen} x} \cdot \left[ \cos x \cdot \ln x + \frac{\operatorname{sen} x}{x} \right]$

50.  $f'(x) = x^{e^x} \cdot e^x \cdot [\ln x + (1/x)]$

51.  $f'(x) = (\operatorname{arctg} x)^x \left[ \ln(\operatorname{arctg} x) + \frac{x}{(1+x^2) \cdot \operatorname{arctg} x} \right]$