

**Calcular las derivadas de las siguientes funciones:**

1.  $y = x^3 - \frac{1}{2}x^2 + 2x - 12$

2.  $y = (ax+b)^2$ , donde  $a$  y  $b$  son constantes.

3.  $y = (x^2 + 3)(2x^2 + x + 1)$

4.  $y = \frac{2x-3}{3x+5}$

5.  $y = \sqrt{x^2 + 5}$

6.  $y = \sqrt[3]{x^2 - 1}$

7.  $y = \sqrt[5]{x^2 - 7x}$

8.  $y = \frac{x^2 - 5x}{x^3 - 1}$

9.  $y = \sqrt{x^2 - 4x + 5}$

10.  $y = \sqrt{\frac{x+3}{x-1}}$

11.  $y = \frac{x^3 - 12x + 2}{x^2 - 7}$

12.  $y = \sqrt{\frac{2x+3}{x-2}}$

13.  $y = \frac{\sqrt{x}-1}{\sqrt{x}+1}$

14.  $y = \left(\frac{x^3 - 1}{2x^3 + 1}\right)^4$

15.  $y = (x-1)\sqrt{x^2 - 2x + 2}$

16.  $y = \sqrt{1 + \sqrt{x}}$

17.  $y = 2x^2\sqrt{2-x}$

18.  $y = \sqrt{2x} + 2\sqrt{x}$

19.  $y = x\sqrt{3x^2 - 1}$

20.  $y = \frac{2x}{\sqrt{x-1}}$

21.  $y = \sqrt{\ln x}$

22.  $y = \ln \sqrt[4]{x^3}$

23.  $y = \ln \frac{2-x}{2+x}$

24.  $y = \ln(x\sqrt{1+x^2})$

25.  $y = \frac{\ln x}{e^x}$

26.  $y = \ln \sqrt{x(x-1)}$

27.  $y = \ln(x + \sqrt{x^2 - 1})$

28.  $y = \ln \frac{e^x}{e^x - 1}$

29.  $y = e^{2x} \ln x^2$

30.  $y = \ln \frac{(x-2)^3}{\sqrt{2x-1}}$

31.  $y = x^3 e^{-3x}$

32.  $y = \ln \frac{e^x - 1}{e^x + 1}$

33.  $y = \ln \sqrt{\frac{1-x}{1+x}}$

34.  $y = (x^2 - 2x + 2)e^x$

35.  $y = x^3 \ln x - \frac{x^3}{3}$

36.  $y = (a+x)\sqrt{a-x}$ , donde  $a$  es una constante.

37.  $y = \ln \frac{\sqrt{1+e^x} - 1}{\sqrt{1+e^x} + 1}$

38.  $y = x - 2\sqrt{x} + 2\ln(1 + \sqrt{x})$

39.  $y = 5\ln^3(ax+b)$ , donde  $a$  y  $b$  son constantes.

40.  $y = \sqrt[3]{a+bx^3}$ , donde  $a$  y  $b$  son constantes.

41.  $y = \sqrt{xe^x + x}$

42.  $y = x^2 \cdot e^{2x}$

43.  $y = \ln^2 x - \ln(\ln x)$

44.  $y = \sqrt{\ln x + 1} + \ln(\sqrt{x} + 1)$

45.  $y = \sqrt{x^2 + 1} - \ln \frac{1 + \sqrt{x^2 + 1}}{x}$

46.  $y = \frac{x}{2} \sqrt{x^2 - a^2} + \frac{a^2}{2} \ln(x + \sqrt{x^2 - a^2})$

47.  $y = x^2 \cdot e^{5x^2}$

48.  $y = \operatorname{sen} 2x$

49.  $y = \cos(3x^2 + 4x + 1)$

50.  $y = \operatorname{sen}(7x + 5)$

51.  $y = \cos(5 - 2x)$

52.  $y = \operatorname{sen}^2 x$

53.  $y = \cos^2(2x + 1)$

54.  $y = \sqrt{\operatorname{sen} 2x}$

55.  $y = 3 \operatorname{tg} 2x$

56.  $y = \frac{1}{2} \cos^3 5x$

57.  $y = \operatorname{tg}^3 5x$

58.  $y = \operatorname{ctg} 4x^2$

59.  $y = \frac{\operatorname{sen}^2(2x + 1)}{\cos(1 - x)}$

60.  $y = \operatorname{cosec}^2(1 - x)$

61.  $y = \sec(5x + 2)$

62.  $y = \ln(\operatorname{tg}(1 - x))$

63.  $y = \frac{\cos 2x + \operatorname{sen} 2x}{\cos 2x - \operatorname{sen} 2x}$

64.  $y = \cos \frac{x+1}{x-1}$

65.  $y = \sqrt{\frac{1 - \operatorname{sen} x}{1 + \operatorname{sen} x}}$

66.  $y = e^x \cdot \cos \frac{x}{2}$

67.  $y = \operatorname{arctg} 3x^2$

68.  $y = \operatorname{arcsen}(2x - 3)$

69.  $y = \operatorname{arccos}(x^2 - 1)$

70.  $y = \operatorname{arctg} \frac{1+x}{1-x}$

71.  $y = \ln \sqrt[3]{\cos 3x}$

72.  $y = \sqrt[3]{\operatorname{sen} x}$

73.  $y = x^{\sec x}$

74.  $y = (\operatorname{arctg} x)^x$

75.  $y = x \cdot \operatorname{arcsen} \frac{1}{x} + \sqrt{1 - x^2}$

76.  $y = \frac{1 + 2 \operatorname{sen}^2 x}{1 - 2 \operatorname{sen}^2 x}$

77.  $y = \operatorname{arctg} \frac{x}{\sqrt{1 - x^2}}$

78.  $y = \operatorname{arcsen} \frac{x}{2} + \ln \sqrt{x^2 - 2}$

79.  $y = (\operatorname{tg} x)^x$

80.  $y = \frac{1}{2} \operatorname{arctg} x + \frac{1}{4} \ln \frac{x^2 + 1}{(x+1)^2}$

**Soluciones**

1.  $y' = 3x^2 - x + 2$

2.  $y' = 2a(ax + b) = 2a^2x + 2ab$

3.  $y' = 8x^3 + 3x^2 + 14x + 3$

4.  $y' = \frac{19}{(3x+5)^2}$

5.  $y' = \frac{x}{\sqrt{x^2+5}}$

6.  $y' = \frac{2x}{3\sqrt[3]{(x^2-1)^2}}$

7.  $y' = \frac{2x-7}{5\sqrt[5]{(x^2-7x)^2}}$

8.  $y' = \frac{-x^4 + 10x^3 - 2x + 5}{(x^3-1)^2}$

9.  $y' = \frac{x-2}{\sqrt{x^2-4x+5}}$

10.  $y' = \frac{-2}{(x-1)\sqrt{x^2+2x-3}}$

11.  $y' = \frac{x^4 - 9x^2 - 4x + 84}{(x^2-7)^2}$

12.  $y' = \frac{-7}{2(x-2)\sqrt{2x^2-x-6}}$

13.  $y' = \frac{1}{\sqrt{x}(\sqrt{x}+1)^2}$

14.  $y' = \frac{36x^2(x^3-1)^3}{(2x^3+1)^5}$

15.  $y' = \frac{2x^2-4x+3}{\sqrt{x^2+2x+2}}$

16.  $y' = \frac{1}{4\sqrt{x+x\sqrt{x}}}$

17.  $y' = \frac{-5x^2+8x}{\sqrt{2-x}}$

18.  $y' = \frac{1+\sqrt{2}}{\sqrt{2x}}$

19.  $y' = \frac{6x^2-1}{\sqrt{3x^2-1}}$

20.  $y' = \frac{x-2}{(x-1)\sqrt{x-1}}$

21.  $y' = \frac{1}{2x\sqrt{\ln x}}$

22.  $y' = \frac{3}{4x}$

23.  $y' = \frac{4}{x^2-4}$

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

25.  $y' = \frac{1-x\ln x}{xe^x}$

26.  $y' = \frac{2x-1}{2x(x-1)}$

27.  $y' = \frac{1}{\sqrt{x^2-1}}$

28.  $y' = \frac{1}{1-e^x}$

29.  $y' = \frac{4xe^{2x}\ln x + 2e^{2x}}{x}$

30.  $y' = \frac{5x-1}{(x-2)(2x+1)}$

31.  $y' = 3x^2e^{-3x}(1-x)$

32.  $y' = \frac{2e^x}{e^{2x}-1}$

33.  $y' = \frac{1}{x^2-1}$

34.  $y' = x^2e^x$

35.  $y' = 3x^2\ln x$

36.  $y' = \frac{a-3x}{2\sqrt{a-x}}$

37.  $y' = \frac{1}{\sqrt{e^x+1}}$

38.  $y' = \frac{\sqrt{x}}{\sqrt{x+1}}$

39.  $y' = \frac{15a\ln^2(ax+b)}{ax+b}$

40.  $y' = \frac{bx^2}{\sqrt[3]{(a+bx^3)^2}}$

41.  $y' = \frac{e^x + xe^x + 1}{2\sqrt{xe^x + x}}$

42.  $y' = 2xe^{2x}(1+x)$

43.  $y' = \frac{2\ln^2 x - 1}{x \ln x}$

44.  $y' = \frac{\sqrt{x+1} + \sqrt{x}\sqrt{\ln x+1}}{2x(\sqrt{x+1})\sqrt{\ln x+1}}$

45.  $y' = \frac{\sqrt{x^2+1}}{x}$

46.  $y' = \frac{x^2}{\sqrt{x^2-a^2}}$

47.  $y' = 2xe^{5x^2}(1+5x^2)$

48.  $y' = 2 \cos 2x$

49.  $y' = -(6x+4) \cdot \text{sen}(3x^2+4x+1)$

50.  $y' = 7 \cos(7x+5)$

51.  $y' = 2 \text{sen}(5-2x)$

52.  $y' = 2 \text{sen } x \cos x = \text{sen } 2x$

53.  $y' = -2 \text{sen}(4x+2)$

54.  $y' = \frac{\cos 2x}{\sqrt{\text{sen } 2x}}$

55.  $y' = \frac{6}{\cos^2 2x} = 6(1+\text{tg}^2 2x)$

56.  $y' = -\frac{15}{2} \cos^2 5x \text{sen } 5x$

57.  $y' = 15 \text{tg}^2 5x(1+\text{tg}^2 5x) = \frac{15 \text{sen}^2 5x}{\cos^4 5x}$

58.  $y' = \frac{-8x}{\text{sen}^2 4x^2}$

59.  $y' = \frac{2 \text{sen}(4x+2)}{\cos(1-x)} - \frac{\text{sen}^2(2x+1) \text{sen}(1-x)}{\cos^2(1-x)}$

60.  $y' = \frac{-2 \cos(1-x)}{\text{sen}^3(1-x)}$

61.  $y' = \frac{5 \text{sen}(5x+2)}{\cos^2(5x+2)}$

62.  $y' = \frac{2}{\text{sen}(2x-2)}$

63.  $y' = \frac{4}{(\cos 2x - \text{sen } 2x)^2}$

64.  $y' = \frac{2}{(x-1)^2} \cdot \text{sen} \frac{x+1}{x-1}$

65.  $y' = \frac{-1}{1+\text{sen } x}$

66.  $y' = e^x \left( \cos \frac{x}{2} - \frac{1}{2} \text{sen} \frac{x}{2} \right)$

67.  $y' = \frac{6x}{1+9x^4}$

68.  $y' = \frac{1}{\sqrt{-x^2+3x-2}}$

69.  $y' = \frac{-2}{\sqrt{2-x^2}}$

70.  $y' = \frac{1}{x^2+1}$

71.  $y' = -\text{tg } 3x$

72.  $y' = \frac{\sqrt{\text{sen } x}}{\text{sen } x} \left( \frac{\cos x}{x} - \frac{\text{sen } x \cdot \ln(\text{sen } x)}{x^2} \right)$

73.  $y' = \left( \frac{\cos x + x \cdot \ln x \cdot \text{sen } x}{x \cos^2 x} \right) x^{\text{sec } x}$

74.  $y' = \frac{(1+x^2) \cdot \text{arctg } x \cdot \ln(\text{arctg } x) + x}{1+x^2} \cdot (\text{arctg } x)^{x-1}$

75.  $y' = \arcsen \frac{1}{x} - \frac{1}{\sqrt{x^2-1}} - \frac{x}{\sqrt{1-x^2}}$

76.  $y' = \frac{8 \text{sen } x \cos x}{(1-2 \text{sen}^2 x)^2}$

77.  $y' = \frac{1}{\sqrt{1-x^2}}$

78.  $y' = \frac{1}{\sqrt{4-x^2}} + \frac{x}{x^2-2}$

79.  $y' = (\text{tg } x)^x \left( \ln(\text{tg } x) + \frac{x}{\text{sen } x \cos x} \right)$

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