

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

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

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

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

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

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

$$48. y = \sin 2x$$

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

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

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

$$52. y = \sin^2 x$$

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

$$54. y = \sqrt{\sin 2x}$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Soluciones

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$49. y' = -(6x+4) \cdot \sin(3x^2+4x+1)$$

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

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

$$52. y' = 2\sin x \cos x = \sin 2x$$

$$53. y' = -2\sin(4x+2)$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$71. y' = -\tan 3x$$

$$72. y' = \frac{\sqrt[3]{\sin x}}{\sin x} \left(\frac{\cos x}{x} - \frac{\sin x \cdot \ln(\sin x)}{x^2} \right)$$

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

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

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

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

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

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

$$79. y' = (\tan x)^x \left(\ln(\tan x) + \frac{x}{\sin x \cos x} \right)$$

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