

BOLETÍN 3.5 .- MÁS DERIVADAS

Halla la derivada de las siguientes funciones:

1. $y = -3x^4 + 7x - 5$

2. $y = (2x^2 + 5)(-x^3 + 1)$

3. $y = (3x + 1)^5$

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

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

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

7. $y = \frac{2}{x+1}$

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

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

10. $y = \frac{16}{x^2(x-4)}$

11. $y = x^{\frac{2}{3}} \cdot x^{\frac{1}{3}} \cdot x^{\frac{2}{6}}$

12. $y = x^{-2} + x^{-3} - x^{-4}$

13. $y = \frac{3x}{\ln x}$

14. $y = \sqrt{x^2 + 3}$

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

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

17. $y = 2 \ln(3x + 5)$

18. $y = \ln(x + 3)$

19. $y = \ln(x^2 - 3x)$

20. $y = \ln\left(\frac{1}{x}\right)$

21. $y = \ln\left(\frac{x+1}{x^2-1}\right)$

22. $y = 6 \ln(\sqrt[3]{\sin^2 3x})$

23. $y = 5 \ln e^{x^3}$

24. $y = e^{x^2+2x-1}$

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

26. $y = e^{-\sin x}$

27. $y = e^{1/x}$

28. $y = x^2 \cdot \sin x$

29. $y = x^3 \cdot \cos x$

30. $y = \sin x \cdot \cos x$

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

32. $y = \operatorname{tg}(2x-1)^2$

33. $y = \operatorname{tg}^4 x^2$

34. $y = -5e^{\frac{2-3x}{10}}$

35. $y = \sqrt[3]{\sqrt[4]{2x+1}}$

36. $y = \log_2(\cos(1-x))$

37. $y = 5 \sin^3(5x+1)^4$

38. $y = 2 \sin(\cos 3x)$

39. $y = \frac{\operatorname{tg} \sqrt{3x}}{4}$

40. $y = 2 \operatorname{cotg} e^{x^2}$

41. $y = (x^2 + 7x)^8$

42. $y = \sqrt[3]{x^3 - 4x}$

43. $y = \sqrt[3]{(x^2 + 7x)^2}$

44. $y = (3x^2 - 5x)^{10}$

45. $y = \left(\frac{1}{x^2} + \frac{1}{x}\right) \cdot x$

46. $y = \sqrt[3]{(1+x)^2}$

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

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

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

50. $y = \frac{a + \sqrt{x}}{a - \sqrt{x}}$

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

52. $y = \left(\frac{x^2 + 2}{4x + 2}\right)^2$

53. $y = \frac{x^6}{(3x+2)^2}$

54. $y = \ln(1+x^2)$

55. $y = \ln\left(\frac{3-5x}{2x+7}\right)$

56. $y = \ln\left(\frac{x}{x^2+4}\right)$

57. $y = \ln\left(\frac{1+\sqrt{x}}{1-\sqrt{x}}\right)$

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

59. $y = e^{-x^2}$

60. $y = (x^2+1) \cdot e^{2x}$

61. $y = e^{\sqrt{x}}$

62. $y = \frac{e^x}{1+e^x}$

63. $y = \ln\left(\frac{1-e^x}{1+e^x}\right)$

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

65. $y = (1+x)^x$

66. $y = \ln^2 x$

67. $y = \ln^3\left(\frac{3x^2-1}{2x}\right)$

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

69. $y = \cos x^2$

70. $y = (\cos x)^x$

71. $y = \operatorname{tg}^2 x$

72. $y = \operatorname{sen}(x^2+3x)$

73. $y = 4\operatorname{sen}^2 x + e^\pi \operatorname{sen} x$

74. $y = 5\cos^2 x + \frac{\cos^3 x}{\ln 2}$

75. $y = \frac{\operatorname{sen} x}{1+\operatorname{tg}^2 x}$

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

77. $y = \arccos x^2$

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

79. $y = \operatorname{arccotg} \frac{1+x}{1-x}$

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

81. $y = \frac{1}{6} \operatorname{arctg}\left(\frac{3}{2} \operatorname{tg} x\right)$

82. $y = (x-2) \cdot \sqrt{4x-x^2} + 4 \operatorname{arcsen} \frac{x-2}{2}$

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

SOLUCIONES

1. $y' = -12x^3 + 7$
2. $y' = -10x^4 - 15x^2 + 4x$
3. $y' = 15(3x+1)^4$
4. $y' = \frac{4}{(x+3)^2}$
5. $y' = \frac{-x^4 + 2x}{(1+x^3)^2}$
6. $y' = \frac{-x^2 - 2x + 3}{(x^2 + 3)^2}$
7. $y' = \frac{-2}{(x+1)^2}$
8. $y' = \frac{2}{(x+2)^3}$
9. $y' = \frac{1-3x^2}{(x^2+1)^3}$
10. $y' = \frac{128-48x}{x^3(x-4)^2}$
11. $y' = \frac{2}{3\sqrt[3]{x}}$
12. $y' = -\frac{2}{x^3} - \frac{3}{x^4} + \frac{4}{x^5}$
13. $y' = \frac{3\ln x - 3}{(\ln x)^2}$
14. $y' = \frac{x}{\sqrt{x^2+3}}$
15. $y' = \frac{-1}{2\sqrt{(x+1)^3}}$
16. $y' = \frac{2x^2-1}{\sqrt{x^2-1}}$
17. $y' = \frac{6}{3x+5}$
18. $y' = \frac{1}{x+3}$
19. $y' = \frac{2x-3}{x^2-3x}$
20. $y' = -\frac{1}{x}$
21. $y' = -\frac{1}{x-1}$
22. $y' = 12 \cotg 3x$
23. $y' = 15x^2$
24. $y' = (2x+2) \cdot 2^{x^2+2x-1}$
25. $y' = 1$
26. $y' = -\cos x \cdot e^{-\sin x}$
27. $y' = -\frac{1}{x^2} \cdot e^{\frac{1}{x}}$
28. $y' = x \cdot (2\sin x + x \cdot \cos x)$
29. $y' = x^2 \cdot (3\cos x - x \cdot \sin x)$
30. $y' = \cos^2 x - \sin^2 x = \cos 2x$
31. $y' = -2(x+1) \cdot \sin(x+1)^2$
32. $y' = (8x-4) \cdot \sec^2(2x-1)^2$
33. $y' = 8x \cdot \operatorname{tg}^3 x^2 \cdot \sec^2 x^2$
34. $y' = \frac{3}{2} e^{\frac{2-3x}{10}}$
35. $y' = \frac{1}{12 \sqrt[24]{(2x+1)^{23}}}$
36. $y' = [\operatorname{tg}(1-x)] \cdot \log_2 e$
37. $y' = 300(5x+1)^3 \sin^2(5x+1)^4 \cos(5x+1)^4$
38. $y' = -6 \sin 3x \cdot \cos(\cos 3x)$
39. $y' = \frac{3}{8\sqrt{3x}} \sec^2 \sqrt{3x}$
40. $y' = -4x \cdot e^{x^2} \cdot \operatorname{cosec}^2 e^{x^2}$
41. $y' = (16x+56) \cdot (x^2+7x)^7$
42. $y' = \frac{3x^2-4}{3\sqrt[3]{x^6-8x^4+16x^2}}$
43. $y' = \frac{4x+14}{3\sqrt[3]{x^2+7x}}$
44. $y' = (60x-50) \cdot (3x^2-5x)^9$
45. $y' = -\frac{1}{x^2}$
46. $y' = \frac{2}{3\sqrt[3]{1+x}}$
47. $y = 3\sqrt{5x}$

$$48. y' = \frac{2+x}{(2+2x)\sqrt{1+x}}$$

$$49. y' = \frac{4x^2-2}{\sqrt{1-x^2}}$$

$$50. y' = \frac{a\sqrt{x}}{x(a-\sqrt{x})^2}$$

$$51. y' = \frac{\sqrt{x}}{4x\sqrt{1+\sqrt{x}}}$$

$$52. y' = \frac{(x^2+2) \cdot (x^2+x-2)}{(2x+1)^3}$$

$$53. y' = \frac{12x^6+12x^5}{(3x+2)^3}$$

$$54. y' = \frac{2x}{1+x^2}$$

$$55. y' = \frac{-41}{(3-5x)(2x+7)}$$

$$56. y' = \frac{-x^2+4}{x^3+4x}$$

$$57. y' = \frac{1}{(1-x)\sqrt{x}}$$

$$58. y' = \frac{2x}{1-x^4}$$

$$59. y' = -2x \cdot e^{-x^2}$$

$$60. y = (2x^2+2x+2) \cdot e^{2x}$$

$$61. y' = \frac{e^{\sqrt{x}}}{2\sqrt{x}}$$

$$62. y' = \frac{e^x}{(1+e^x)^2}$$

$$63. y' = -\frac{2e^x}{1-e^{2x}}$$

$$64. y' = \frac{1}{1-x^2}$$

$$65. y' = (1+x)^x \cdot \left(\ln(1+x) + \frac{x}{1+x} \right)$$

$$66. y' = \frac{2 \ln x}{x}$$

$$67. y' = 3 \cdot \frac{6x^2+2}{6x^3-2x} \cdot \ln^2 \frac{3x^2-1}{2x}$$

$$68. y' = \sin 2x$$

$$69. y' = -2x \cdot \sin x^2$$

$$70. y' = (\cos x)^x [\ln \cos x - x \operatorname{tg} x]$$

$$71. y' = 2 \operatorname{tg} x \cdot \sec^2 x$$

$$72. y' = (2x+3) \cdot \cos(x^2+3x)$$

$$73. y' = 4 \sin 2x + e^{\pi} \cos x$$

$$74. y' = -\cos x \cdot \sin x \cdot \left(10 + \frac{3 \cos x}{\ln 2} \right)$$

$$75. y' = \cos x \cdot (3 \cos^2 x - 2)$$

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

$$77. y' = \frac{-2x}{\sqrt{1-x^4}}$$

$$78. y' = \frac{6x}{1+9x^4}$$

$$79. y' = \frac{-1}{1+x^2}$$

$$80. y' = \operatorname{arccosec} \frac{1}{x}$$

$$81. y' = \frac{1}{4 \cos^2 x + 9 \sin^2 x}$$

$$82. y' = 2\sqrt{4x-x^2}$$

$$83. y' = \frac{8}{x^3 \sqrt{x^2-4}}$$