Ejercicios de derivadas

Calcula las derivadas de las siguientes funciones:

1. $y = \ln \sqrt[n]{1+x^2}$ 2. $y = \ln \dfrac{x}{\sqrt{x^2+a^2}}$ 3. $y = \ln \sqrt{x(1-x)}$

4. $y = ln \dfrac{(x-2)^3}{\sqrt{2x-1}}$ 5. $y = \ln\left(x + \sqrt{x^2-1}\right)$ 6. $y = e^{4x}$ 7. $y = \dfrac{e^x + e^{-x}}{2}$

8. $y = e^{3-x^2}$ 9. $y = x^3 \times e^{-3x}$ 10. $y = \dfrac{e^{ax}}{\sqrt{x}}$ 11. $y = a^{nx}$ 12. $y = 10^{\sqrt{x}}$

13. $y = 3^{2x^2}\sqrt{x}$ 14. $y = \ln \dfrac{e^x - 1}{e^x + 1}$ 15. $y = (3x+1)^{2x-3}$ 16. $y = \ln sen x$

17. $y = \ln \cos 2x$ 18. $y = \sqrt{\dfrac{1-senx}{1+senx}}$ 19. $y = \ln \sqrt{\dfrac{1+\cos x}{1-\cos x}}$

20. $y = e^x \cos \dfrac{x}{2}$ 21. $y = senx \times sen2x$ 22. $y = arcsen(2x - 3)$

23. $y = arctag\, 3x^2$ 24. $y = arctag \dfrac{1+x}{1-x}$ 25. $y = cotag(a - 2x)$

26. $y = e^{ax} \times sen\pi x$ 27. $y = \ln \sqrt[3]{\cos 3x}$ 28. $y = \dfrac{1}{3} tag^3 x - tagx + x$

29. $y = x \times arcsen \dfrac{1}{x} + \sqrt{1 - x^2}$ 30. $y = \dfrac{1}{ab} arctag\left(\dfrac{b}{a} tagx\right)$ 31. $y = x^{senx}$

32. $y = \log \sqrt{\dfrac{1+x}{1-x}}$ 33. $y = \ln \sqrt[3]{\dfrac{3x}{x+2}}$ 34. $y = x^2 \times \ln(2 - x)$ 35. $y = x \ln(1 - x^2)$

36. $y = \dfrac{\ln x}{x}$ 37. $y = x \ln x - x$ 38. $y = \dfrac{\ln x}{\sqrt{x}}$ 39. $y = \cos(3x^2 + 4x - 1)$

40. $y = tag\sqrt{x}$ 41. $y = 4\cos^5(2x-1)$ 42. $y = \cot ag\, 4x^2$ 43. $y = \cot ag^2 4x$

44. $y = \sec 5x$ 45. $y = \sqrt{sen3x}$ 46. $y = \cos \dfrac{x+1}{x-1}$ 47. $y = arcsen\left(\dfrac{1}{\ln x}\right)$

48. $y = arctag \dfrac{x}{\sqrt{1-x^2}}$ 49. $y = arcsen \dfrac{x}{2} + \ln \sqrt{x^2 - 2}$ 50. $y = (tagx)^{senx}$ 51. $y = sen(senx)$

Soluciones:

1. $\frac{2x}{n\left(1+x^2\right)}$ 2. $\frac{a^2}{x\left(x^2+a^2\right)}$ 3. $\frac{1-2x}{2x(1-x)}$ 4. $\frac{5x-1}{(x-2)(2x-1)}$ 5. $\frac{1}{\sqrt{x^2-1}}$ 6. $4\times e^{4x}$

7. $\frac{e^x-e^{-x}}{2}$ 8. $-2x\times e^{3-x^2}$ 9. $3x^2\ e^{-3x}\ (1\ x)$ 10.. $\frac{e^{ax}\left(2ax-1\right)}{2x\sqrt{x}}$

11. $n\times a^{nx}\ \ln a$ 12. $\frac{1}{2\sqrt{x}}\ 10^{\sqrt{x}}\ \ln 10$ 13. $3^{2x^2}\left(4x\sqrt{x}\ln 3\ \ \frac{1}{2\sqrt{x}}\right)$ 14. $\frac{2e^x}{e^{2x}-1}$

15. $\left(3x+1\right)^{2x-3}\left[2\ln\left(3x+1\right)+\frac{3\left(2x-3\right)}{3x+1}\right]$ 16. $\cot gx$ 17. $-2tag2x$ 18. $\frac{-1}{1+sen x}$

19. $\frac{-1}{sen x}$ 20. $e^x\left(\cos\frac{x}{2}-\frac{1}{2}sen\frac{x}{2}\right)$ 21. $\cos x\times sen2x\ +2sen x\ \times\cos 2x$ 22. $\frac{2}{\sqrt{1-\left(2x-3\right)^2}}$

23. $\frac{6x}{1+9x^4}$ 24. $\frac{1}{1+x^2}$ 25. $\frac{2}{sen^2\left(a-2x\right)}$ 26. $e^{ax}\left(asen\pi x+\pi\cos\pi x\right)$ 27. $-tag3x$

28. tag^4x 29. $arcsen\frac{1}{x}-\frac{1}{\sqrt{x^2-1}}-\frac{x}{\sqrt{1-x^2}}$ 30. $\frac{1+tag^2x}{a^2+b^2tag^2x}$ 31. $x^{senx}\left(\cos x\ln x+\frac{senx}{x}\right)$

32. $\frac{1}{1-x^2}\times\frac{1}{\ln 10}$ 33. $\frac{2}{3x\left(x+2\right)}$ 34. $2x\ \ln\left(2\ \ x\right)\ \ \frac{x^2}{2-x}$ 35. $\ln\left(1\ \ x^2\right)\ \ \frac{2x^2}{1-x^2}$

36. $\frac{1-\ln x}{x^2}$ 37. $\ln x$ 38. $\frac{2-\ln x}{2x\sqrt{x}}$ 39. $-\left(6x+4\right)sen\left(3x^2+4x-1\right)$

40. $\frac{1}{2\sqrt{x}\cos^2\sqrt{x}}=\frac{1}{2\sqrt{x}}\left(1+tag^2\sqrt{x}\right)$ 41. $-40\cos^4\left(2x-1\right)\times sen\left(2x\ \ 1\right)$

42. $-\frac{8x}{sen^2 4x^2}=-8x\left(1+\cot ag^2 4x^2\right)$ 43. $\frac{-8\cot agx}{sen^2 4x}$ 44. $5\sec 5x\times tag5x$

45. $\frac{3\cos 3x}{2\sqrt{sen3x}}$ 46. $\frac{2}{\left(x-1\right)^2}\times sen\frac{x+1}{x-1}$ 47. $\frac{-1}{x\times\ln x\ \sqrt{\left(\ln x\right)^2\ \ 1}}$ 48. $\frac{1}{\sqrt{1-x^2}}$

49. $\frac{1}{\sqrt{4-x^2}}+\frac{x}{x^2-2}$ 50. $\left(tagx\right)^{senx}\left(\cos x\ln tagx+\frac{1}{\cos x}\right)$ 51. $\cos\left(senx\right)\times\cos x$