Cálculo A

Derivadas de funções trigonométricas, trigonométricas inversas, exponencial e logarítmica

Encontre as derivadas das funções

1. $y = \cos x - 4\sin 5x$
2. $y = \sin^2 x$
3. $y = \frac{1}{\tan^3 3x}$
4. $y = \sec^4 10x$
5. $y = \csc(4 - 2x)$
6. $y = \sin^2(3 - 2x^2)$
7. $y = x \cot x^2$
8. $y = \frac{\sin 2x}{\cos 5x}$
9. $y = \frac{x \sin x}{x+1}$
10. $y = \sqrt{\sin 3x}$
11. $y = (1 + \tan^3 x)^{1/4}$
12. $y = \sin^3 x + \cos x$
13. $y = \sin 2x \ \cos 2x$
14. $y = \frac{\sin x + \cos x}{\sin x - \cos x}$
15. $y = \ln(3x^2 + 1)$
16. $y = e^{1-2x}$
17. $y = x \ln x$
18. $y = \log_{10}(3 - 4x)$
19. $y = \ln(3 \cos x)$
20. $y = x^2 + x^3 e^{4x}$
21. $y = \sin e^{2x}$
22. $y = e^{-2x} \sin 3x$
23. $y = \frac{e^x - e^{-x}}{e^x + e^{-x}}$
24. $y = x(\sin \ln x - \cos \ln x)$
25. $y = e^{\sin \frac{1}{x}}$
26. $y = \ln(\cos(\sin^2 x))$
27. $y = \ln(\sec x + \tan x)$
28. $y = x\sqrt{x^2 + 1} - \ln(x + \sqrt{x^2 + 1})$
29. $y = \ln(x + 4 + \sqrt{8x + x^2})$
30. $y = x^{-x} \ \ (x > 0)$
31. $y = x^{4 \cos x} \ \ (x > 0)$
32. $y = (\sin x)^x \ \ (0 < x < \pi)$
33. $y = (1 + \frac{1}{x})^{x^2} \ \ (x > 0)$
34. $y = (\frac{2}{x})^{3/x} \ \ (x > 0)$
35. $y = (\ln x)^{\ln x} \ \ (x > 1)$
36. $y = x^{3/2} e^{-2x}$
37. $y = \frac{e^x}{\ln(x-1)}$
38. $y = \operatorname{arcot}(x^2 + 2)$
39. $y = \arctan(2 - x^2)$
40. $y = x \operatorname{arcsc}(x^2 + 5)$
41. $y = \arctan \sqrt{x + 2}$
42. $y = \operatorname{arcot} \sqrt{x^2 - 1}$
43. $y = x^2 \operatorname{arcsec} x$
44. $y = \operatorname{arcot}(\frac{1+x}{1-x})$
45. $y = \arcsin(\frac{1-x}{1+x}) \quad (1 + x > 0)$
46. $y = \arcsin \ln x$
47. $y = 2^{\arcsin 3x} + (1 - \arccos 3x)^2$
48. $y = \ln \arcsin x + \frac{1}{2} \ln^2 x + \arcsin \ln x$
49. $y = \arctan \ln \frac{1}{x}$
50. $y = \frac{x \ \arcsin x}{\sqrt{1-x^2}} + \ln \sqrt{1 - x^2}$

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~~[illegible]~~ - Resposta

1. $y' = -\sin x - 20\cos 5x$

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

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

3. $y' = -9\,\dfrac{\sec^2 3x}{\operatorname{tg}^4 3x}$

4. $y' = 40\sec^4 10x \cdot \operatorname{tg} 10x$

5. $y' = 2\operatorname{cossec}(4-2x)\operatorname{cotg}(4-2x)$

6. $y' = -8x\sin(3-2x^2)\cos(3-2x^2)$

7. $y' = \operatorname{cotg} x^2 - 2x^2\operatorname{cossec}^2 x^2$

8. $y' = \dfrac{2\cos 2x\cos 5x + 5\sin 2x\sin 5x}{\cos^2 5x}$

~~9. $y' = \dfrac{\sin x + x\cos x\,(x+1)}{x+1}$~~

9. $y' = \dfrac{\sin x + (x^2+x)\cos x}{(x+1)^2}$

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10. $y' = \frac{3\cos 3x}{2\sqrt{\sin 3x}}$

11. $y' = \frac{3}{4} \frac{tg^2 x \sec^2 x}{(1+tg^3 x)^{3/4}}$

12. $y' = 3\sin^2 x \cos x - \sin x$

13. $y' = 2(\cos^2 2x - \sin^2 2x) = 2\cos 4x$

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

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

16. $y' = -2e^{1-2x}$

17. $y' = \ln x + 1$

18. $y' = \frac{-4}{(\ln 10)(3-4x)}$

19. $y' = -tg\, x$

20. $y' = 2x + 3x^2 e^{4x} + 4x^3 e^{4x}$

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21. $y' = 2e^{2x} \cos e^{2x}$

22. $y' = e^{-2x}(-2\sin 3x + 3\cos 3x)$

23. $y' = \dfrac{4}{(e^x + e^{-x})^2}$

24. $y' = 2 \sin \ln x$

25. $y' = \dfrac{1}{x^2} e^{\sin \frac{1}{x}} \cos \dfrac{1}{x}$

26. $y' = -\sin 2x \operatorname{tg}(\sin^2 x)$

27. $y' = \sec x$

28. $y' = \dfrac{2x^2}{\sqrt{1+x^2}}$

29. $y' = \dfrac{1}{\sqrt{8x+x^2}}$

30. $y' = -x^{-x}(1+\ln x)$

31. $y' = 4x^{4\cos x}\left(\dfrac{\cos x}{x} - \sin x \ln x\right)$

32. $y' = (\sin x)^x (\ln \sin x + x \operatorname{cotg} x)$

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

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34. $y' = \frac{-3}{x^2}\left(\frac{2}{x}\right)^{3/x}\left(\ln\frac{2}{x} + 1\right)$

35. $y' = \frac{1}{x}(\ln x)^{\ln x}(\ln\ln x + 1)$

36. $y' = \frac{1}{2}\sqrt{x}\, e^{-2x}(3-4x)$

37. $y' = e^x\left[\frac{(x-1)\ln(x-1) - 1}{(x-1)(\ln(x-1))^2}\right]$

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

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

40. $y' = \operatorname{arc\,cosec}(x^2+5) - \frac{2x^2}{(x^2+5)\sqrt{(x^2+5)^2-1}}$

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

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

43. $y' = 2x \operatorname{arc\,sec} x + \frac{x}{\sqrt{x^2-1}}$

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

45. $y' = -\frac{1}{\sqrt{x}(1+x)}$ $(\text{com } (1+x) > 0)$

46. $y' = \frac{1}{\sqrt{1-\ln^2 x}} \cdot \frac{1}{x}$

47. $y' = \frac{3}{\sqrt{1-9x^2}} \left(2^{\arcsin 3x} \ln 2 + 2(1-\arccos 3x)\right)$

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

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

50. ~~$y' = \frac{2 \arcsin x + \ln\sqrt{1-x^2}}{\sqrt{1-x^2}}$~~

$y' = \frac{\arcsin x}{(1-x^2)^{3/2}}$