

Differentiate the following with respect to x :

1. $3x^4 + 2x^3 + 5$
2. $x^{\frac{2}{3}} - \cot x$
3. $2 \ln x$
4. $\frac{x}{m} + \frac{m}{x} + 2\sqrt{x} + \frac{2}{\sqrt{x}}$
5. $\cos(2x - 5)$
6. $\sin 2x + \cos\left(\frac{1}{2}x\right)$
7. $x - \ln x$
8. $\log_2 x$
9. $\log_2 x^2$
10. e^{2x}
11. e^{ex}
12. e^{e^x}
13. $(\sin x + \cos x)^3$
14. $e^x \sec x$
15. $\ln(\sin x)$
16. $\ln(\ln x)$
17. $\lg(x^2 + x + 1)$
18. $(\sin 3x^2)^3$
19. $\frac{\sin x + 2}{\sec x}$
20. x^e
21. $e^{-x} \sin 2x$
22. $\frac{\tan x}{x}$
23. $x^5 \cot 2x$
24. $\sin \sqrt{x}$
25. 2^x
26. $2^{\sin x}$
27. $\frac{\ln x}{x}$
28. $\frac{x}{\ln x}$
29. $\frac{2x}{\pi}$
30. $x^2 - \ln x$
31. e^{x^2}
32. $\ln(x^2 + 1)$
33. $\tan x \sec x$
34. $2x \cos 2x$
35. $\ln x^2 + e^{x^2}$
36. $\sqrt{x + \sin x}$
37. $(\log_5 x + \operatorname{cosec} x)^2$
38. $\ln x^2 \tan 5x$
39. $(1 + \ln x)^2$
40. $e^{\sin 5x}$
41. $\operatorname{cosec} x^2$
42. $\cot^2 x$
43. $\frac{\tan x}{(x+1)^2}$
44. $\frac{\cot x}{x-1}$
45. $\sqrt[4]{x^2 + 1}$
46. $\tan(5e^{x^2})$
47. $\frac{1 - 2 \sin x}{\cos 3x}$
48. $\frac{1}{x^2} - \frac{1}{\sin^2 x}$
49. $\sqrt{x + \sqrt{x} + \sqrt{x}}$
50. x^x