Find the derivative of each of the following functions by using the product rule.

1. $-\cos(x)\sin(x)$
2. $-\cos(x)(10x+4)$
3. $\log_4(x)(3x^3+21)$
4. $\cot(x)\sqrt{x}$
5. $\log_4(x)(5x^2+8x+4)$
6. $e^x\left(\frac{1}{x}\right)$
7. $x^{2008}\sin(x)$
8. $\sqrt[19]{x}e^x$
9. $-\cos(x)9^x$
10. $\sin(x)\sqrt{x}$
11. $x^{46}(-\sin(x))$
12. $x^{2008}\sec(x)$
13. $2^x(-\cos(x))$
14. $2^x\cos(x)$
15. $\cot(x)9^x$
16. $-\sin(x)\left(\frac{1}{x}\right)$
17. $\tan(x)\csc(x)$
18. $\ln(x)\sin(x)$
19. $\tan(x)\sqrt{x}$
20. $\sqrt{x}\csc(x)$
21. $\sqrt[18]{x}\tan(x)$
22. $\sin(x)\cos(x)$
23. $\cos(x)\ln(x)$
24. $x^{46}9^x$
25. $2^x\sqrt{x}$
26. $\ln(x)(5x^2+8x+4)$
27. $x^{46}\sin(x)$
28. $\log_4(x)\ln(x)$
29. $-\cos(x)\csc(x)$
30. $\sqrt[3]{x}\tan(x)$
31. $\tan(x)(10x+4)$
32. $\ln(x)(10x+4)$
33. $x^{2008}\cos(x)$
34. $2^x\sec(x)$
35. $\cos(x)(3x^3+21)$
36. $x^{100}(-\sin(x))$
37. $\cot(x)\left(\frac{1}{x}\right)$
38. $e^x\cos(x)$
39. $\log_4(x)\sqrt{x}$
40. $-\cos(x)\sqrt{x}$
41. $\sqrt{x}9^x$
42. $\sqrt{x}\sin(x)$
43. $e^x\sqrt[31]{x}$
44. $\tan(x)\left(\frac{1}{x}\right)$
45. $\ln(x)(-\cos(x))$
46. $\sqrt[19]{x}\ln(x)$
47. $x^{100}\sin(x)$
48. $\cot(x)(-\sin(x))$
49. $\sqrt[19]{x}\tan(x)$
50. $\log_4(x)\sqrt[31]{x}$
51. $\ln(x)\cos(x)$
52. $\sqrt{x}\ln(x)$
53. $2^x\csc(x)$
54. $x^{100}9^x$
55. $\sqrt[18]{x}(-\cos(x))$
56. $\sqrt[19]{x}\sin(x)$
57. $x^{100}\cot(x)$
58. $\ln(x)(-\sin(x))$
59. $\log_4(x)\sec(x)$
60. $-\sin(x)\cot(x)$
61. $\sqrt[18]{x}\cos(x)$
62. $\frac{1}{x}9^x$
63. $e^x\sqrt{x}$
64. $\sin(x)\left(\frac{1}{x}\right)$
65. $2^x(10x+4)$

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