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

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

Solutions:

1. $\dfrac{(5x^2+12x+1)\left(\frac{1}{11\sqrt[11]{x^{10}}}\right) - \sqrt[11]{x}(10x+12)}{(5x^2+12x+1)^2}$
2. $\dfrac{\sqrt{x}\frac{1}{x\ln 12} - \log_{12}(x)\frac{1}{2\sqrt{x}}}{(\sqrt{x})^2}$
3. $\dfrac{(x^3+15)e^x - e^x(3x^2)}{(x^3+15)^2}$
4. $\dfrac{\cot(x)\left(\frac{1}{12\sqrt[12]{x^{11}}}\right) - \sqrt[12]{x}(-\csc^2(x))}{(\cot(x))^2}$
5. $\dfrac{(-22x+8)\frac{1}{x} - \ln(x)(-22)}{(-22x+8)^2}$
6. $\dfrac{\sqrt{x}\sec^2(x) - \tan(x)\frac{1}{2\sqrt{x}}}{(\sqrt{x})^2}$
7. $\dfrac{(x^3+15)\sec^2(x) - \tan(x)(3x^2)}{(x^3+15)^2}$
8. $\dfrac{\cot(x)(-\sin(x)) - \cos(x)(-\csc^2(x))}{(\cot(x))^2}$
9. $\dfrac{\cos(x)(31x^{30}) - x^{31}(-\sin(x))}{(\cos(x))^2}$
10. $\dfrac{(5x^2+12x+1)(-\cos(x)) - (-\sin(x))(10x+12)}{(5x^2+12x+1)^2}$
11. $\dfrac{(-\cos(x))e^x - e^x\sin(x)}{(-\cos(x))^2}$
12. $\dfrac{\cot(x)(100x^{99}) - x^{100}(-\csc^2(x))}{(\cot(x))^2}$
13. $\dfrac{\sqrt[14]{x}\frac{1}{x} - \ln(x)\left(\frac{1}{14\sqrt[14]{x^{13}}}\right)}{(\sqrt[14]{x})^2}$
14. $\dfrac{(5x^2+12x+1)2^x(\ln 2) - 2^x(10x+12)}{(5x^2+12x+1)^2}$
15. $\dfrac{(11x^3)e^x - e^x(33x^2)}{(11x^3)^2}$
16. $\dfrac{(x^3+15)\frac{1}{x} - \ln(x)(3x^2)}{(x^3+15)^2}$
17. $\dfrac{\ln(x)(-\cos(x)) - (-\sin(x))\frac{1}{x}}{(\ln(x))^2}$
18. $\dfrac{(11x^3)\sin(x) - (-\cos(x))(33x^2)}{(11x^3)^2}$
19. $\dfrac{(-\sin(x))(31x^{30}) - x^{31}(-\cos(x))}{(-\sin(x))^2}$
20. $\dfrac{\sec(x)(2008x^{2007}) - x^{2008}\sec(x)\tan(x)}{(\sec(x))^2}$
21. $\dfrac{\tan(x)\left(\frac{1}{2\sqrt{x}}\right) - \sqrt{x}\sec^2(x)}{(\tan(x))^2}$
22. $\dfrac{(-22x+8)(2008x^{2007}) - x^{2008}(-22)}{(-22x+8)^2}$
23. $\dfrac{\ln(x)\cos(x) - \sin(x)\frac{1}{x}}{(\ln(x))^2}$
24. $\dfrac{\csc(x)\left(\frac{1}{11\sqrt[11]{x^{10}}}\right) - \sqrt[11]{x}(-\csc(x)\cot(x))}{(\csc(x))^2}$
25. $\dfrac{\cos(x)\left(\frac{1}{3\sqrt[3]{x^2}}\right) - \sqrt[3]{x}(-\sin(x))}{(\cos(x))^2}$
26. $\dfrac{(-\cos(x))\frac{1}{x} - \ln(x)\sin(x)}{(-\cos(x))^2}$
27. $\dfrac{\ln(x)\frac{1}{x\ln 12} - \log_{12}(x)\frac{1}{x}}{(\ln(x))^2}$
28. $\dfrac{(11x^3)\cos(x) - \sin(x)(33x^2)}{(11x^3)^2}$
29. $\dfrac{(x^3+15)(2008x^{2007}) - x^{2008}(3x^2)}{(x^3+15)^2}$
30. $\dfrac{\ln(x)\left(\frac{1}{3\sqrt[3]{x^2}}\right) - \sqrt[3]{x}\frac{1}{x}}{(\ln(x))^2}$
31. $\dfrac{(x^3+15)\left(\frac{1}{11\sqrt[11]{x^{10}}}\right) - \sqrt[11]{x}(3x^2)}{(x^3+15)^2}$
32. $\dfrac{\tan(x)(2008x^{2007}) - x^{2008}\sec^2(x)}{(\tan(x))^2}$
33. $\dfrac{(-22x+8)\left(-\csc^2(x)\right) - \cot(x)(-22)}{(-22x+8)^2}$
34. $\dfrac{\sqrt[14]{x}\frac{1}{x\ln 12} - \log_{12}(x)\left(\frac{1}{14\sqrt[14]{x^{13}}}\right)}{(\sqrt[14]{x})^2}$
35. $\dfrac{10^x\left(\frac{1}{3\sqrt[3]{x^2}}\right) - \sqrt[3]{x}(10^x)(\ln 10)}{(10^x)^2}$
36. $\dfrac{\left(\frac{1}{x}\right)\frac{1}{x\ln 12} - \log_{12}(x)\left(\frac{-1}{x^2}\right)}{\left(\frac{1}{x}\right)^2}$
37. $\dfrac{\sqrt[14]{x}\left(-\csc^2(x)\right) - \cot(x)\left(\frac{1}{14\sqrt[14]{x^{13}}}\right)}{(\sqrt[14]{x})^2}$
38. $\dfrac{\sin(x)(2008x^{2007}) - x^{2008}\cos(x)}{(\sin(x))^2}$

39. $\dfrac{\csc(x)e^x - e^x(-\csc(x)\cot(x))}{(\csc(x))^2}$

40. $\dfrac{e^x\left(-\csc^2(x)\right) - \cot(x)\,e^x}{(e^x)^2}$

41. $\dfrac{(x^3+15)\left(\frac{1}{2\sqrt{x}}\right) - \sqrt{x}(3x^2)}{(x^3+15)^2}$

42. $\dfrac{\csc(x)2^x(\ln 2) - 2^x(-\csc(x)\cot(x))}{(\csc(x))^2}$

43. $\dfrac{10^x(31x^{30}) - x^{31}(10^x)(\ln 10)}{(10^x)^2}$

44. $\dfrac{(-22x+8)\sin(x) - (-\cos(x))(-22)}{(-22x+8)^2}$

45. $\dfrac{(11x^3)\frac{1}{x\ln 12} - \log_{12}(x)\,(33x^2)}{(11x^3)^2}$

46. $\dfrac{e^x\left(\frac{1}{3\sqrt[3]{x^2}}\right) - \sqrt[3]{x}e^x}{(e^x)^2}$

47. $\dfrac{(-22x+8)\left(\frac{1}{12\sqrt[12]{x^{11}}}\right) - \sqrt[12]{x}(-22)}{(-22x+8)^2}$

48. $\dfrac{\tan(x)(100x^{99}) - x^{100}\sec^2(x)}{(\tan(x))^2}$

49. $\dfrac{(-\cos(x))\frac{1}{x\ln 12} - \log_{12}(x)\sin(x)}{(-\cos(x))^2}$

50. $\dfrac{(x^3+15)(31x^{30}) - x^{31}(3x^2)}{(x^3+15)^2}$

51. $\dfrac{(-\sin(x))\left(\frac{1}{3\sqrt[3]{x^2}}\right) - \sqrt[3]{x}(-\cos(x))}{(-\sin(x))^2}$

52. $\dfrac{\cot(x)\sec^2(x) - \tan(x)\left(-\csc^2(x)\right)}{(\cot(x))^2}$

53. $\dfrac{(-\cos(x))\left(\frac{1}{12\sqrt[12]{x^{11}}}\right) - \sqrt[12]{x}\sin(x)}{(-\cos(x))^2}$

54. $\dfrac{(11x^3)2^x(\ln 2) - 2^x(33x^2)}{(11x^3)^2}$

55. $\dfrac{\sec(x)(100x^{99}) - x^{100}\sec(x)\tan(x)}{(\sec(x))^2}$

56. $\dfrac{(-22x+8)\frac{1}{x\ln 12} - \log_{12}(x)\,(-22)}{(-22x+8)^2}$

57. $\dfrac{\sqrt{x}\left(\frac{1}{12\sqrt[12]{x^{11}}}\right) - \sqrt[12]{x}\frac{1}{2\sqrt{x}}}{(\sqrt{x})^2}$

58. $\dfrac{\cot(x)\frac{1}{x} - \ln(x)\left(-\csc^2(x)\right)}{(\cot(x))^2}$

59. $\dfrac{(-22x+8)2^x(\ln 2) - 2^x(-22)}{(-22x+8)^2}$

60. $\dfrac{(5x^2+12x+1)\left(\frac{1}{12\sqrt[12]{x^{11}}}\right) - \sqrt[12]{x}(10x+12)}{(5x^2+12x+1)^2}$