Practice Derivative Problems

In the following exercise, use the shortcut rules for the derivative to find the desired derivatives.

1. $f(x) = (2x+1)\sqrt{x^2+1}$
2. $f(x) = e^{\ln(x^5+6)}$
3. $f(x) = 2\sqrt{x} + \dfrac{1}{\sqrt{x}}$
4. $f(x) = e^x + e^x$
5. $f(x) = (3x^5-1)^{\frac{3}{4}}(x^3+2)^{\frac{8}{9}}$
6. $f(x) = 3^{x^2+5x+1}$
7. $f(x) = [(x^4-7x^2)^6 + 4x^3]^5$
8. $f(x) = 1 + \ln x + (\ln x)^2 + (\ln x)^3$
9. $f(x) = (x^3+5x+9)^{\frac{3}{2}}$
10. $f(x) = e^{\ln(1+e^{\ln x})}$ hint: simplify first.
11. $f(x) = \sqrt[3]{x^3 + \dfrac{1}{x^3}}$
12. $f(x) = \ln(\ln(\ln(x+2)))$
13. $f(x) = (\ln x + xe^x + 1)^3$
14. $f(x) = e^{\sqrt{x^4+3x}}\ln(x^2+2x)$
15. $f(x) = e^{x^4+3x^2+1}(4x^3+6x)^2$
16. $f(x) = e^{e^x} + \ln(\ln(\ln x))$
17. $f(x) = \left[\dfrac{\ln(x)+4}{e^x}\right]^4$
18. $f(x) = (x^2+6x+1)^4$
19. $f(x) = [\ln(x^2+1)]^{\frac{4}{3}}$
20. $f(x) = e^x + \ln x + e^\pi$
21. $f(x) = (x^{\frac{2}{3}} - 3x^{\frac{1}{2}} + 6x^{-\frac{4}{5}})e^{x^2+1}$
22. $f(x) = (e^{x^4+x^2} + e^{x^4} + e^{x^2})(x^4+x^2)$
23. $f(x) = \left(\dfrac{\ln x}{x^2+1}\right)^3 + e^{x^3}(3x^4+2x+1)^2$
24. $f(x) = \left[\left(\dfrac{7x^4-x^2}{x^6}\right)^5 + (x^2-1)^3(2x+x^3)^5\right]^{\frac{3}{8}}$
25. $f(x) = \sqrt{e^{x^2} + (e^{x^{\frac{1}{2}}}+1)(\ln(x^4+1)+3)^2}$