Derivative Worksheet

Take the derivatives of the following functions. At each step, remember to ask yourself whether you want to use product rule, quotient rule, chain rule, or simplify the function.

1. $(\frac{2}{t} + t^5)(t^3 + 1)$
2. $\frac{(x^3+1)\sqrt{x}}{x^2}$
3. $\sqrt{\theta}(\sqrt{\theta} + \frac{1}{\sqrt{\theta}})$
4. $\frac{1-t^3}{(1-t)(1+t+t^2)}$
5. $\frac{r}{3} + \sqrt{\frac{3}{r}} + \frac{1}{3r}$
6. $\arcsin(\frac{60}{x}) - \arctan(\frac{40}{x})$
7. $\sinh(\cosh(\cosh(\sinh(t))))$
8. $\ln(\ln(\ln(\sqrt{x})))$
9. $(5x^2 - 2x^{0.3})3^{2x}\arcsin(x)$
10. $e^{-x}\cos(x)\ln(x)(2x^7 + \sqrt{x})$
11. $\frac{e^m \sqrt[3]{m}}{\sin^2(m)+3}$
12. $\ln\left(\frac{(x^2+1)e^x}{\sin(x)}\right)$
13. $\arctan\left(\frac{\ln(5x)x^3}{\sec(e^x)}\right)$
14. $2^{4x^3}\cosh(\cos(e^{-x}))\sqrt{\left(\ln(\frac{1}{x})\right)^2 + 1}$
15. $\sin(e^{(x+1)^2 e^{\frac{1}{x+1}}})$
16. $\left[\ln(\frac{1-\cos(\alpha t)}{1+\cos(\alpha t)})\right]^4$ α is a constant
17. $\sqrt{\frac{\sin(\arctan(5x+3))}{\cos(\arctan(5x+3))}}$
18. $t\sec(\sqrt{t}e^t)$
19. $\arccos(x)$
20. $\log(x)\ln(10)$
21. $\ln(\tan(x)e^x)$
22. $(\csc(1) + \sec(u))^3$
23. $(\cos(x) + \cosh(x))^2 - 2\cos(x)\cosh(x) - (\sinh(x) - \sin(x))(\sinh(x) + \sin(x))$