1. $f'(x) = 100(x+1)^{99}$

2. $f'(x) = \dfrac{-x}{\sqrt{1-x^2}}$

3. $\dfrac{dw}{dt} = 200t\left(t^2+1\right)^{99}$

4. $\dfrac{dw}{dt} = 300t^2\left(t^3+1\right)^{99}$

5. $\dfrac{dw}{dt} = \dfrac{50}{\sqrt{t}}\left(\sqrt{t}+1\right)^{99}$

6. $f'(t) = 3e^{3t}$

7. $h'(w) = 5\left(w^4-2w\right)^4\left(4w^3-2\right)$

8. $w'(r) = \dfrac{2r^3}{\sqrt{r^4+1}}$

9. $f'(\theta) = 2^{-\theta}(\ln 2)(-1) = 2^{-\theta}(-\ln 2)$

10. $g'(x) = 2(\ln 3)3^{(2x+7)}$

11. $\dfrac{dy}{dx} = \pi^{(x+2)}\ln\pi$

12. $k'(x) = 4\left(x^3+e^{2x}\right)^3\left(3x^2+2e^{2x}\right)$

13. $f'(x) = e^{2x}\left(2x+5^x\ln 5\right)+2e^{2x}\left(x^2+5^x\right)$

14. $g'(t) = 6(1+3t)e^{(1+3t)^2}$

15. $v'(t) = t^2\left(-c\cdot e^{-ct}\right)+2te^{-ct}$

$v'(t) = -t(ct-2)e^{-ct}$

16. $\dfrac{dw}{dx} = x^2\cdot 5^x\ln 5 + 2x\cdot 5^x$

17. $\dfrac{dy}{dx} = te^{-t^2}(-2t)+e^{-t^2} = e^{-t^2}\left(1-2t^2\right)$

18. $\dfrac{dw}{dt} = \left(t^2+3t\right)\left(2e^{-2t}\right)+(2t+3)\left(1-e^{-2t}\right)$

19. $h'(x) = \dfrac{(2x+3)(2x)-\left(x^2+9\right)(2)}{(2x+3)^2}$

$h'(x) = \dfrac{2\left(x^2+3x-9\right)}{(2x+3)^2}$

20. $h'(z) = 4\left(\dfrac{b}{a+z^2}\right)^3\left(\dfrac{-2bz}{\left(a+z^2\right)^2}\right)$

$h'(z) = \dfrac{-8b^4z}{\left(a+z^2\right)^5}$

21. $f'(\theta) = \dfrac{e^{-\theta}}{\left(1+e^{-\theta}\right)^2}$

22. $\dfrac{dw}{dx} = \left(\pi+3t^2\right)\left(-e^t\right)+(6t)\left(4-e^t\right)$