1. Use logarithmic differentiation to find the derivative of the function $y=\left(x^{4}+x\right)^{5 x}$.
2. Use logarithmic differentiation to find the derivative of the function $y=x^{x^{2}+5}$.
3. Use logarithmic differentiation to find the derivative of the function $y=\left(x^{2}+1\right)^{x}$.
4. Use logarithmic differentiation to find the derivative of the function $y=\left(x^{2}+1\right)^{x+1}$.
