Logarithmic Differentiation Review

Find the derivative of the following functions

1. $y = x^{x^2}$

2. $y = (e + 1)^x$

3. $y = x^{\pi^2}$

4. $y = (3 + x)^{2x}$

5. $y = \dfrac{(4+x)(2+3x)}{(1+2x)(3-2x)^3}$