Let $a = \sqrt{2}^{\sqrt{2}^{\sqrt{2}^{\cdots}}}$ and $y = x^{x^{x^{\cdots}}}$.

What is the value of $a$?
What is the derivative of $y$?
Draw the graph of $y$. For which values of $x$ is $y$ well-defined?

To submit your solutions for a chance to win an Amazon gift card, and to find out detailed contest rules,
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