

1. (3 points) Let $F(x) = \sqrt{1 - \sqrt{1 + x^{2\pi}}}$. Find $F'(x)$.

2. (3 points) The moon moves according to the equations $(x(t), y(t)) = (\pi t, \pi^t + \pi)$.
Find the slope of the tangent line after 1 second.

Hint: in case you forgot, remember that $\frac{d}{dx}a^x = \ln a \cdot a^x$.

3. (4 points) Use implicit differentiation to find the slope of the tangent line to the unit circle.