

3. a) State and prove the Theorem on Derivatives of Inverse Functions.

b) Prove that $\frac{d}{dx} \arcsin(x) = \frac{1}{\sqrt{1-x^2}}$.

4. BONUS QUESTION: Derive a formula for the derivative of the infinite exponential function $y = x^{x^{x^{\dots}}}$, defined for $0 < x \leq e^{1/e}$ as the inverse of $x = y^{1/y}$.