Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Find $(f^{-1})'(2)$ if $f(x) = \sqrt{2x^4 + x^2 + 1}, x \geq 0$.

2. Find $\frac{dy}{dx}$ if $x^y = y^x$.

3. (a) Use the derivatives of exponential functions to show that $(\operatorname{csch} x)' = -\operatorname{csch} x \coth x$.

(b) Find the derivative $f'(x)$ if $f(x) = e^{2x} \operatorname{csch}(5x)$.

4. Find the critical points of the function $f(x) = \sqrt[5]{x^3 - 12x}$