1. Suppose that $a, b, c, d$ are real numbers. Prove that

$$4abcd \leq a^4 + b^4 + c^4 + d^4.$$ 

2. Suppose that $a, b, x, y$ are real numbers satisfying $a < x < b$ and $a < y < b$. Show that $|x - y| < b - a$.

3. Sketch the graph of the equation $y = |x + 2| - |x - 1|$.

4. Find all real numbers $x$ that satisfy the inequality $4 < |x + 1| + |x - 1| < 6$. 