Math 1190 Quiz #8

Problem 1: Divide the numbers 1, 2, 3, 4, and 5 into two arbitrarily chosen sets. Prove that one set contains two numbers and their difference.

Problem 2: Determine the value of

$$\left(1-\sqrt{1+\frac{1}{27}}\right)^{1/3}+\left(1+\sqrt{1+\frac{1}{27}}\right)^{1/3}.$$

Problem 3: For $x \neq 0$, define $f(x) = x^8 - x^5 - \frac{1}{x} + \frac{1}{x^4}$. Show that $f(x) \geq 0$.

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