Math 1190 Quiz #9

Problem 1: Find the maximum value of the function $f(x, y, z) = 2x + 6y + 10z$ given that $x^2 + y^2 + z^2 = 35$.

Problem 2: For $x > 0$, find the minimum value of the expression

$$\frac{(x + 1/x)^6 - (x^6 + 1/x^6) - 2}{(x + 1/x)^3 + (x^3 + 1/x^3)}.$$

Problem 3: Find all real-valued functions f on the real line such that for all x

$$[f(x)]^2 = \int_0^x \{[f(t)]^2 + [f'(t)]^2\}\, dt + 2009.$$

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