

Problem 6 (due on Monday, November 18).

For real numbers  $a, b, c$  consider the system of equations  $\begin{cases} x^2 + 2yz = a \\ y^2 + 2xz = b \\ z^2 + 2xy = c \end{cases}$ . Prove that this system has at most one solution in real numbers  $x, y, z$  such that  $x \geq y \geq z$  and  $x + y + z \geq 0$ . Prove that such a solution exists if and only if  $a + b + c \geq 0$  and  $b = \min(a, b, c)$ . Here  $\min(a, b, c)$  denotes the smallest number among  $a, b, c$ .

No solution were submitted. For a detailed solution see the following link [Solution](#).

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