TITLE HERE

NAME HERE

DATE HERE

Problem 1 *Find two real numbers x and y such that $x, y, x+y, x^2, y^2, x^2-y^2, x^3, y^3, x^4, y^4$ are all irrational but x^2+y^2 is rational.*

Solution: Here we find $x, y \in \mathbb{R}$ such that the following 11 conditions are met:

Problem 2 *If $k \geq 2$ and $x \in \mathbb{R}^k$, prove that there exists $y \in \mathbb{R}^k$ such that $y \neq 0$ but $x \cdot y = 0$. Is this also true if $k = 1$?*

Proof: (type solution here)

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