1. For each statement, do the following: (a) Write the statement in symbolic form (b) Without explicitly using negation, write the negation of the statement in symbolic form. (c) Decide if the statement is true or false. (d) Write a proof of the statement that is true.

   (a) For all $x \in \mathbf{R}_{>0}$, there is $M \in \mathbf{R}$ such that $\frac{1}{x} + 1 > M$. (SB)

   (b) There is $M \in \mathbf{R}$ such that for all $x \in \mathbf{R}_{>0}$, we have $\frac{1}{x} + 1 > M$. (DD)

   (c) There is $m \in \mathbf{R}$ such that for all $x \in \mathbf{R}$, we have $1 + m(x-1) \le x^2$. (TK)

   (d) For every $a \in \mathbf{R}$, there is $m \in \mathbf{R}$ such that for all $x \in \mathbf{R}$, we have $a^2 + m(x-a) \le x^2$. (AK)

   (e) For all $x, y \in \mathbf{R}$, we have $(x^2 = y^2) \implies (x = y)$. (DM)

   (f) For all $x, y \in \mathbf{R}$, we have $(x^3 = y^3) \implies (x = y)$. (CR)