1. (3 points) Write the following as an English sentence. Say whether it is true or false.

\[ \forall x \in \mathbb{R}, \exists n \in \mathbb{N}, x^n \geq 0 \]

Answer: For every real number \( x \) there is a natural number \( n \) such that \( x^n \geq 0 \).

2. (3 points) Translate the following sentence into symbolic logic.

There exists a real number \( a \) for which \( a + x = x \) for every real number \( x \).

Answer: \( \exists a \in \mathbb{R}, \forall x \in \mathbb{R}, a + x = x \)

3. (4 points) Negate the following sentence. Note that \( x \) is a variable.

For every positive number \( \epsilon \), there is a positive number \( M \) for which \( |f(x) - b| < \epsilon \) whenever \( x > M \).

Answer: There exists a positive number \( \epsilon \) such that for every positive number \( M \) there exists a number \( x \) which satisfies \( x > M \) and \( |f(x) - b| \geq \epsilon \).

Alternate Answer: There exists a positive number \( \epsilon \) with the property that for every positive number \( M \) there exists \( x > M \) with \( |f(x) - b| \geq \epsilon \).