NAME:

1. Is the following statement true or false? If \( x \in \mathbb{N} \) then \( x \in \mathbb{R} \). T F

2. State the converse of this statement.

Is the converse true or false? T F

3. State the contrapositive of the statement in (1).

Is the contrapositive true or false? T F

3. Is the following statement true or false? \( x^2 = 9 \) if and only if \( x = 3 \) T F

4. Circle the correct answer. For \( S_n = (0, \frac{1}{n}) \), \( \bigcap_{n=1}^{\infty} S_n = \)
(a) \{0\} (b) \{1\} (c) \emptyset (d)[0, 1] (e) (0, 1)

5. Consider the dynamical system given by the function \( f(x) = 2x + 1 \).
   (i.) The fixed point is (circle one) (a) \{-1\} (b) \{\frac{1}{2}\} (c) \{0\} (d)\{\frac{1}{2}\} (e) \{1\}
   (ii.) For the initial value \( x_0 = 0 \), the value of \( x_2 \) is (circle one)
         (a) 0 (b) 1 (c) 2 (d) 3 (e) 4

6. The function \( f : \mathbb{N} \to \mathbb{N} \) defined by \( f(n) = n^3 \) is
   a. onto \( \mathbb{N} \) T F
   b. one to one T F

7. Give the distance between the following two points in \( \mathbb{R}^3 \): \( \vec{p} = (1, 2, -3) \) and \( \vec{q} = (2, -1, -2) \).