Name _____ Transitions, Quiz 2

1) Sketch an outline of each of the following proof methods. (10 points each)

a. Proof of an equality

b. Proof of an implication

c. Proof of a subset

d. Proof of an if-and-only-if.

e. Proof of an existential

f. Proof of a universal

g. Proof by cases

2) Explain what the following means. $\forall_{\varepsilon>0}\exists_{N\in\mathbb{Z}_{\geq 0}}(n \geq N \Rightarrow |a_n| < \varepsilon)$ (15 points)

3) Write the following statement in mathematical notation: "There is a number whose square is smaller than any real number" (15 points)

4) Let $f_n(x) = x^n$. Show that for all $z > 0$, there is an $n \in \mathbb{R}$ such that $f_n(2) < z$ (100 points)