

**Discrete Math**  
**Quiz 1**

**Name:** \_\_\_\_\_

You have 10 minutes to complete this quiz. If you have a question raise your hand and remain seated. In order to receive full credit your answer must be **complete, legible** and **correct**. When appropriate, show your work and give adequate explanations.

1. Identify the following axioms of set theory and rewrite the axioms using English words instead of mathematical symbols.

(a)  $(\exists x)((\forall y)(y \notin x))$

(Axiom of the Empty Set) There is a set with no elements.

(b)  $(\forall x)(\forall y)((x = y) \leftrightarrow \forall z((z \in x) \leftrightarrow (z \in y)))$

(Axiom of Extensionality) Any two sets,  $x$  and  $y$ , are equal if and only if they have the same elements.

2. Complete the following definition of “subset”:

$x$  is a subset of  $y$  if \_\_\_\_\_.

Two possible answers (which express the same thing):

(a)  $x$  is a subset of  $y$  if  $z \in x$  implies  $z \in y$ .

(b)  $x$  is a subset of  $y$  if every element of  $x$  is an element of  $y$ .