

# Key

## Math 150 Quiz 4

1. Use a truth table to determine the validity of the following argument:

If I have seen farther than others, it is because I stood on the shoulders of giants.  
 I have not seen farther than others.

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I have not stood on the shoulders of giants.

① p: "I have seen farther than others."

q: "I have stood on the shoulders of giants."

②  $p \rightarrow q$   
 $\sim p$   


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 $\sim q$

③  $[(p \rightarrow q) \wedge \sim p] \rightarrow \sim q$

④

p	q	$p \rightarrow q$	$\sim p$	$(p \rightarrow q) \wedge \sim p$	$\sim q$	$[(p \rightarrow q) \wedge \sim p] \rightarrow \sim q$
T	T	T	F	F	F	T
F	T	T	T	T	F	F
T	F	F	F	F	T	T
F	F	T	T	T	T	T

This argument is invalid due to the F in the last column.

2. Let  $A = \{-3, 0, 3\}$ ,  $B = \{-2, -1, 0, 1, 2\}$ ,  $C = \{-3, -1\}$ ,  $D = \{0\}$ ,  $E = \{-3\}$ , and  $U = \{-3, -2, -1, 0, 1, 2, 3\}$ . Insert  $\subseteq$  or  $\not\subseteq$  to make the given statements true.

- a)  $E \subseteq A$   
 b)  $B \not\subseteq C$   
 c)  $\{0, 2\} \not\subseteq D$

3. List all possible subsets of  $\{O, \Delta, \square\}$ .

O	$\Delta$	$\square$	subsets
T	T	T	$\{O, \Delta, \square\}$
F	T	T	$\{\Delta, \square\}$
T	F	T	$\{O, \square\}$
F	F	T	$\{\square\}$
T	T	F	$\{O, \Delta\}$
F	T	F	$\{\Delta\}$
T	F	F	$\{O\}$
F	F	F	$\emptyset$