Quiz #4

SOLUTIONS

1. { 6 points } **Determine whether each of these statements is true or false.**
Check the appropriate box:

(a) $\emptyset \in \{\emptyset\}$

✓ **True**
☐ False

(b) $\emptyset \subset \{0\}$

✓ **True**
☐ False

The empty set $\emptyset$ is a proper subset of every nonempty set.

(c) $0 \subseteq \{0\}$

☐ True
✓ **False**

0 is not a set.

2. { 4 points } **Let A and B be sets. Prove that**

$$A \cap B = B \cap A$$

We apply the definition of the intersection of sets and receive

$$A \cap B = \{x \mid x \in A \ \wedge \ x \in B\}$$
$$= \{x \mid x \in B \ \wedge \ x \in A\} = B \cap A$$

using the logical equivalence $P \wedge Q \equiv Q \wedge P$ for every two propositions P and Q.