

6) Suppose that $A = \{ 2, 4, 6 \}$, $B = \{ 2, 6 \}$, $C = \{ 4, 6 \}$, and $D = \{ 4, 6, 8 \}$. Determine which of these sets are subsets of which other of these sets.

$B \subset A$ and $C \subset D$ and $C \subset A$

10) Determine whether these statements are true or false.

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

True. The null set is an element of the set containing the null set.

b) $\emptyset \in \{\emptyset, \{\emptyset\}\}$

True. The null set is an element of the set containing the null set.

c) $\{\emptyset\} \in \{\emptyset\}$

False. The set containing the null set is not an element in the set containing the null set.

d) $\{\emptyset\} \in \{\{\emptyset\}\}$

True. The set containing the null set is an element of the set containing the set containing the null set.

e) $\{\emptyset\} \subset \{\emptyset, \{\emptyset\}\}$

True. The set containing the null set is a strict subset of the set containing the null set and the set inside a set containing the null set.

f) $\{\{\emptyset\}\} \subset \{\emptyset, \{\emptyset\}\}$

True. The set containing the null set is a subset of the set containing the set containing the null set. Since there are two elements in this set on the right, this is a subset since the left is not equal to the right.

g) $\{\{\emptyset\}\} \subset \{\{\emptyset\}, \{\emptyset\}\}$

False. This is interesting. Since no items are repeated in the subset, the two null sets are treated as one. Since this is a proper subset, the subset cannot be equal. If the subset sign was \subseteq then this would actually be true.