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Homework 3

Part A
1)
```
Function add(v, item):
        If item in set:
                Return set v
        Else:
                Add item to set v
        Return set v
```

The time constant is Big O(N) for adding a new item to a list that is acting as a set because you have to search through the whole list to confirm if the item is or is not already in the list. The Function add would be O(1) for a dictionary because with a dictionary you can perform an O(1) mathematical operation to determine if the key is already being used in the dictionary.

2)
```
Function union(v, w):
        Create set union_set
        For each item i in v:
                If not in union_set add i to union_set
        For each item i in w:
                If not in union_set add i to union_set
        Return union_set
```

The time constant is O(M + N) because you must add each element of v and w one by one to the set. The time constant for a dictionary would be O(M + N) because you still have to add each element one-by-one.