7.2.a) 23, yes
7.2.b) ({s, top_unlabeled_node}, {middle_unlabeled_nodes, d, t}), 23

7.7)

```
while there is a client without a station:
	c <- the client in range of the fewest stations
	if c has no empty stations in range:
		return false
	s <- the station with the fewest connections in range of c
	connect(c, s)
return true
```

8.3)
This can be reduced to k-sat by defining each clause to be (v1, v2, v3, …, vk), where each v is true if the councilor has been trained in a given sport and false otherwise. k-sat is NP-complete.

8.15) This can be reduced to k-sat (k in this case being the number of frequencies) by defining each clause to be (v1, v2, v3, …, vk), where each v is true if the frequency is blocked at a given location and false otherwise. This does *not* solve the problem of if it is possible given a certain number of sensors, but it shows that even determining if it is possible given infinite sensors is NP-complete and as such the second portion does not matter.

10.5.a)

```
min_dom_set(V, E):
	v <- the lowest cost node
	s_vs <- the nodes connected to v not in S
	S = min({v} + min_dom_set(V-s_vs, E), {min(s_vs)} + min_dom_set(min(s_vs), E))
	return S
```

10.5.b)

```
while there are unmarked nodes:
	v <- the lowest cost node that does not share a node in the decomposition with a
covered node
	S += {v}
	mark all nodes connected connected to v as covered
return S
```

10.8)
Create a bipartite graph in with all variables on one side and all clauses on the other, with edges between the variables and the clauses they are in. By Hall's Theorem, there must be a matching and therefor this problem must be satisfiable (simply set all variables in the matching to true). Because the matching problem is solvable in polynomial time and the reduction is possible in polynomial time, this problem must also be solvable in polynomial time.