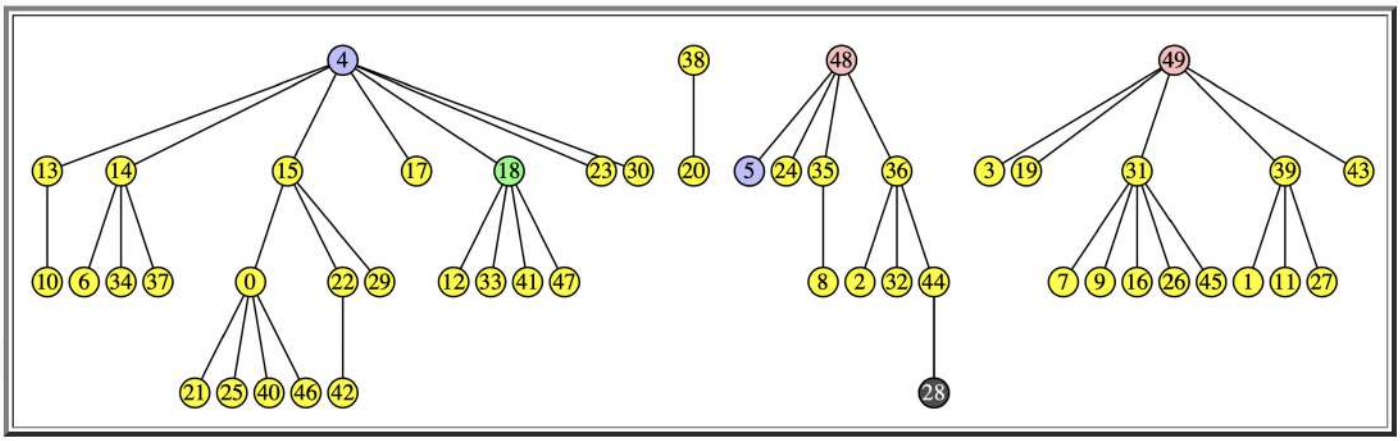
Behold the following instance of disjoint sets. Links go from low to high.




1. How many disjoint sets are there?
2. If I say **Union(4,5)** (blue nodes) why will there be an error?
3. If I'm using Union-by-size, and I call **Union(48,49)** (pink nodes), what node's link will change?
4. If I'm using Union-by-height, and I call **Union(48,49)**, what node's link will change?
5. If I'm using Union-by-rank-with-path-compression, how many links change when I call **Find(28)** (gray).
6. If I'm using Union-by-rank-with-path-compression, **Ranks[18]** (green) can be three? Answer T or F.

## Answers to Clicker Questions

**Question 1**: Four.

**Question 2**: 5 is not a set id.

**Question 3**: 48

**Question 4**: 49

**Question 5**: 2 (28 and 44)

**Question 6**: It originally was the root of a set whose height was three. For example, perhaps node 23 linked to 18 and 30 linked to 23. That set was unioned with 4, and then Find(30) was called. Because of path compression, nodes 30 and 23 now link directly to 4.