Intro to Proofs Day 24 Outline (This class meets for 110 minutes.)

**Need: fun problems and keys**

PART 1: Synthesis (0-20 minutes)

**Section 7.2 Exercise 5**

* a,b in Z a~b if and only if |a-b|<=3. Reflexive since |a-a|=0<=3. Symmetric since |a-b| = |b-a| so if |a-b|<= 3 then |b-a|<= 3. Not transitive, |3-0|<= 3 so 0~3, and |6-3|<=3 so 3~6 but 0 is not related to 6

**Section 7.3 Exercise 7 (a)-(c)**

* (a) For a real number a, a-a = 0 which is rational. So reflexive. If a-b is rational then b-a = -(a-b) is rational (rational numbers closed under multiplication). So symmetric. If a-b is rational and b-c is rational then (a-b) + (b-c) is rational. So transitive.
* (b) sqrt{2}, sqrt{2}+5, sqrt{2}-3
* © the equivalence class of any rational number is all rational numbers.

PART 2: Section 7.3/7.4 worksheet (20-60 minutes)

**(7 minutes) Discuss with their group their answers to page 1, discuss conjectures**

* This is a partition!

**(8 minutes) Discuss their conjectures. Talk about how all equivalence relations partition sets into their equivalence classes.**

**(10 minutes) Work on Exercise on page 2**

**(10 minutes) Discuss adding congruence classes. (Work through table on board for congruence mod 3). Then they do congruence mod 4. What do you notice?**

------------------------------------------BREAK --------------------------------------------------

PART 3: Play! (70-95 minutes)

* Give them keys problem have them play and come up with conjectures.
* Or the lottery winner problem

PART 5: Quiz (95-110 minutes)

**Fill out exam review**

**No preview/synthesis**

**Work on proof portfolio!**

**Quiz Wednesday:** S4 (last chance), S5 (second chance), S6 (second chance)