Intro to Proofs Day 6 Outline (This class meets for 110 minutes.)

**Need cards, Section 2.4 Worksheet, Section 3.1 Worksheet**

***Note: We had a snow day and they were asked to do the rest of the 2.3 worksheet and most of the 2.4 worksheet***

***Show upcoming events. Questions on proof portfolio?***

PART 1: Synthesis Stuff (0-35 minutes)

**Synthesis Trading**[0-15 minutes]

* Read each other’s proofs. Evaluate for correctness and use your checklist to determine if they met the writing guidelines.

**Synthesis Presentation** [15-35 minutes]

* Section 2.3 #1 (a), (b), (f) (page 61)
  + (a) {x\in R| 2x^2+3x-2=0} = {-2, ½}
  + (b) {x\in Z| 2x^2+3x-2 = 0} = {-2}
  + (f) {y\in Z| |y-2|<= 2.5} = {0,1,2,3,4}
* Section 2.3 #2 (page 61)
  + {1,4,9,16,25,…}={x\in N| x= k^2 some k\in N}
  + {3,9,15,21,27,…} = {x\in N | x =3(2k+1) some k \in N}
  + {…-pi^4, -pi^3, -pi^2, -pi, 0} = {x\in R | x = -pi^k some k\in Z, k\geq 0}
  + {0,4,8,…,96,100} = {n \in N | n=4k for k in Z 0<= k<= 25}
* Section 2.3 #3 (page 61-62)
  + {x\in R | x(x+2)^2(x-3/2)=0}. Then {-2,0,3} is nothing, {-2,-2,0,3/2} and {3/2, -2, 0} are equal, and {-2,3/2} is a subset.

PART 2: SETS! (35-55 minutes)

**Worksheet 2.3 page 2** [35-45 minutes]

* Go over #2 and #3 answering any questions from PA

**Quick Check** [45-55 minutes]

* Read { a in Z | a=3k for some k in Z} in words and describe what the set is in roster notation
* Write the set of all real numbers whose square is greater than 10 in set builder notation.
* Write the set {1, 3, 9, 27, 81,…} in set builder notation. DISCUSS: Could write as
  + {x in N|x=3^k some k \in N}
  + OR {3^m | m\in N}

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

PART 3: For all and there exists and their negations [60-75]

**Questions on 2.4 [60-75 minutes]**

* Questions on PA solutions?
* Questions on worksheet?
* **Additional things to add:** How is it different to prove a “for all” statement vs. a “there exists” statement? What’s a counterexample?
* Depending on time – do page 4. Otherwise it’s extra (challenging) practice

PART 4: 75-90

**Go over preview activity on divides**

* PA Goals: Use language correctly for divides, factor, multiple, divisor. Use the definition of divides correctly. Use the notation of divides correctly.

**Activity 1 on 3.1 Worksheet**

* They work through on their own. Raise their hand when they are ready to talk.

PART 5: QUIZ [90-110]

* Skills L1, L2, L3

Synthesis: Section 2.4 Exercise 3 (a), (d), (e), Exercise 4 (a), (b) (also see if you can determine truth value) OR Section 3.1 1(a)?

Preview: Section 3.1 Preview Activity 2 or congruence in general. Read proof of Theorem 3.1 on pages 88-89