Intro to Proofs Day 6 Outline (This class meets for 1 hour and 50 minutes.)

**Need 3.1 worksheets, quizzes, synthesis to hand back, snacks/pens/cards**

**Present Synthesis Activities** [0-20 minutes]

* Section 2.2 #7 (b)
* Section 2.3 #2
  + A = {1,4,9,16, 25,…}: Four other elements: 36, 49, 64. Set builder notation {x\in\N : x = n^2 for some n\in\N}
  + B = {…, -pi^4, -pi^3, -pi^2, -pi, 0}: Four other elements: -pi^5, -pi^6, -pi^7. Set builder: {x\in\R : x = -pi^n for some n\in\N or x = 0}
  + C ={3,9,15,21,27,…}. Four other elements: 33, 39, 45, 51. Set builder: {x\in\N : x = 6n-3 for some n\in\N}
* Section 2.4 #2 (a)-(c)
  + For all m in Z, m^2 is even:
    - Counterexample: 3 is an integer and 3^2 = 9 is odd since 9=2(4)+1 and 4 \in \Z
    - Negation: There exists m in Z such that m^2 is odd.
  + For all x in the real numbers, x^2>0:
    - Counterexample: 0\in\R and 0^2=0 which is not greater than 0
    - Negation: There exists a real number x such that x^2<= 0
  + For each real number x, \sqrt{x}\in\R
    - Counterexample: -2\in\R and \sqrt{-2}\notin \R
    - Negation: There exists a real number x such that sqrt{x} \in \R

*Go over some tex symbols: typing sets specifically. (Use Overleaf cheat sheet?)*

**Section 2.4 worksheet** [20-50 minutes]

* Go over Activity 1 with group
* They work on Activities 2-4
* Play negation telephone

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

**Preview Activity** [60-70 minutes]

* Go over snapshots. In particular talk about does not divide.
* Go over slide 7

**Section 3.1 – More Direct Proofs** [70-90 minutes]

**Quiz!** [90-110 minutes]

For next time: SA6: Section 2.4 #8 on page 76, Section 3.1 #1(a) – type a complete proof. Note there’s a partial solution in the back of the book if you get stuck.

PA6: Contrapositive (Section 3.2)