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

**Need 3.2 worksheets, quizzes, synthesis to hand back, snacks/pens/cards**

**Present Synthesis Activities** [0-25 minutes]

* Section 3.1 #1a
  + For all integers a,b, and c with a not 0 if a divides b and a divides c then a divides b-c
  + Trade proofs – look at writing guidelines.
* Section 3.1 #1c
  + If 4 divides a-1 then 4 divides a^2-1
  + 4k = a -1. Then a^2 -1 = (4k+1)^2 -1 = 16k^2 + 8k +1 – 1 = 4(4k^2+2k). Then 4k^2 + 2k is an integer.
* Section 3.1 #3b
  + If 6 divides ab then 6 divides a or 6 divides b.

**Section 3.1 Worksheet** [25-40 minutes]

* Messing around with congruences

**Discuss Preview Activity for Wednesday** [40-60]

* Questions –
  + Practice writing some contrapositive statements
    - If n^2 is even then n is even.
    - If p is prime then p=2 or p is odd.
    - If a function f is differentiable at a then f is continuous at a.
    - If you are happy and you know it then clap your hands.
  + When to use proof by contrapositive
    - If more algebraically complicated thing is in the hypothesis
    - If the hypothesis is hard to work and the negation of the conclusion is easier to work with.
  + Do a proof by contrapositive of if n^2 is even then n is even.

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

**Section 3.2** [60-70 minutes]

* They work on logical equivalences
* Emphasize P if and only if Q means prove both directions

**Section 3.2** [70-90 minutes]

* They work on the proof

**Quiz** [80-110 minutes]

For next time: SA8:

Preview activity – negate some statements? Or just Section 3.3 preview