Intro to Proofs Day 12 Outline (This class meets for 1 hour and 50 minutes.)

**Need 3.4/3.5 worksheets, exams to hand back, snacks/pens/cards**

**Go over Exam stuff** [0-10 minutes]

* Display slide – I am dead serious about academic dishonesty
* Hand exam back – absolutely no discussion
* Boundaries – you can not make an appointment to discuss your exam before the revision appointment. You can come to office hours. Acceptable questions are: I looked at this source and this source and I am confused because…, in my notes I have written, is that correct. I can not read this comment. Unacceptable questions are: I haven’t looked at this yet, but…, is this right?

**Synthesis Activity** [10-20 minutes]

* Go around and check while they discuss.
* Go over as a class.
* Make list of contradictions: m=0 when we assumed m was positive, a contradiction with something we assumed, 0=1, 3 divides 1, a^2<0,

**Section 3.3 – Example [20-30 minutes]**

* If r is a real number such that r^2 =2 then r is irrational.
* Say sqrt{2} is rational. Then sqrt{2} =p/q where p,q \in Z and q\neq 0. In addition, assume p and q have no comman factors. 2 = p^2/q^2. Then 2q^2 = p^2. So 2 divides p^2, that is, p^2 is even. Thus p is even (lemma). So p = 2x. So 2q^2 = (2x)^2 or 2q^2 = 4x^2 or q^2 = 2x^2. So q^2 is even so q is even, or 2 divides q. Thus p and q have a common factor, a contradiction.

**Section 3.3 – Pages 3 and 4 [30-50 minutes]**

* Supposed to be “If r is a real number such that r^3 = 2 then r is irrational.”
* They work through rest of worksheet

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**Section 3.3 – Pages 3 and 4 [50-70 minutes]**

* They work, we go over some.

**Section 3.4/3.5 – The division algorithm [70-90 minutes]**

* Do some examples together as a class.
* They do worksheet page 1
* Discuss page 2 if there’s time.

**Quiz [90-110 minutes]**

For next time: Preview Activity #8 on proof by cases

Synthesis #11: #5a (do a proof by contradiction) evaluating proofs #19 (a), (b) on page 101 ,#19(a) on page 115