Math 5370 **GAME THEORY** Spring 2019
Dr. Duval **Homework**
Wednesday, May 1

Follow the separate general guidelines for Parts A,B,C. Be sure to include and label *all four* standard parts (a), (b), (c), (d) of Part A in what you hand in.

Proof of Arrow's Impossibility Theorem

Section 13.7

A: Reading questions. Due by 2pm, Sun., 5 May

1. Give details how Figure 13.14 illustrates the proof of Lemma 13.7.1. In other words, match individual sentences in the proof to specific aspects of the diagram.
2. Draw a diagram illustrating the definition of B-**pivotal** voter. (Consider the other diagrams in this section as a model.) Give a little more detail about how the sentence following the definition ("Such a voter...") matches the precise definition given in Definition 13.7.2.
3. What earlier proof in Chapter 13 does the proof of Lemma 13.7.3 resemble?
4. Draw a more detailed version of Figure 13.16 with 5 voters, 6 candidates, and show not just π_3, but also π, π_1, and π_2. Purposely pick π [say that three times fast] to best illustrate the proof of Lemma 13.7.4.

B: Warmup exercises. For you to present in class. Due by the end of class Mon., 6 May

None, but be ready to discuss the proof (given at the end of this section) of Theorem 13.3.1.

Proof of the Gibbard-Satterthwaite Theorem

Section 13.8

A: Reading questions. Due by 2pm, Tue., 7 May

1. Where was the idea of Definition 13.8.1 used previously in this chapter (possibly in more than one place)?
2. Add to the Figure 13.17 by showing π_i. Now draw another version of π_i so that your two versions correspond to the "two cases to rule" at the top of p. 218.
3. Draw diagrams illustrating each of Definition 13.8.3 and Claim 13.8.4. (Consider the other diagrams in this section as a model.) Purposely pick π and S to best illustrate the definition and the claim. You may use different π and S for each of the two diagrams.

B: Warmup exercises. For you to present in class. Due by end of class Wed., 8 May

None, but be ready to discuss the proof (given at the end of this section) of Theorem 13.4.2.