1A SRP WORKSHEET 1

NAME: CLASS: TUTOR:

5 Very good
4 Good
3 Satisfactory
2 Weak
1 Very weak

Reading
Papineau, *Philosophical Devices* Part I ch. 1
Steinhart, *More Precisely* Ch. 1, 2.

UNDERSTAND:

DON'T UNDERSTAND:

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SECTION A

Define: union, intersection, subsethood, power set and Cartesian product. Let C and D be the sets of all cats and all dogs. Let *Rxy* be the relation *x is bigger than y* and let f denote Fido, who is a dog.

(a) Use set-theoretic notation to write down expressions for the following sets:

1. The set of all animals that are cats or dogs
2. The set of all cats smaller than Fido
3. The set of all sets of dogs smaller than Fido
4. The set of all dogs smaller than every cat
5. The set of all cat-dog mixed pairs (e.g. in a chess competition)
6. The set of all possible mixed pairs involving Fido
7. The set of all possible mixed pairs not involving Fido

(b) What are the members of $\wp(\wp(\varnothing))$?

*(c) True or false? $\wp(X) = \wp(Y)$ iff X = Y. Say briefly why.

*(d) Write down the axiom of extensionality. Say briefly why it follows from the axiom that at most one set is empty.

SECTION B

Say which of the following relations are symmetric, transitive, or reflexive over some domain of people in which siblings share both parents and which contains both Jane Austen (*Persuasion*) and Sir Walter Scott (*Waverley*).

1. Most people prefer x to y
2. x and y are distinct siblings
3. x is a brother of y
4. *x and y are both alive and x is at least one year older than y
5. *x and y are both alive and x is at least 150 years older than y
6. *x and y were once married
7. *x wrote *Waverley* iff y wrote *Persuasion*