

**Exercise 1** (27 pts.) Some of the following cases are possible for Frege, but others are not. For each possible case give an example. For the impossible cases, state that they are impossible and why. (By “expression” I mean linguistic expression, like a bunch of words, say).

- (a) An expression which has sense but no referent.
- (b) Two expressions with different senses but the same referent.
- (c) Two different conceptions that two speakers associate with a single word with a single sense.
- (d) Two different expressions (e.g. written differently) with the same sense.
- (e) An expression with a referent, but no sense.
- (f) Two different expressions (e.g. written differently) with the same sense but different referents.
- (g) Two persons who use the same word, which has the same sense and referent, and where both persons have the same (i.e. identical) conception of the referent.
- (h) A sense which contributes to a Thought expressed by one sentence, but which also serves as the referent of a distinct sense expressed by a word in another sentence.
- (i) A physical object which functions as the referent of a sense expressed by a word in one sentence, but which functions as a sense contributing to a Thought expressed by another sentence.

**Exercise 2** (15 pts.) Consider a sentence like the following.

- (1) Either nobody broke into the house, or the person who broke into the house was very careful.

Some people think (1) can be true when nobody broke into the house. There is a danger that Frege does not respect that judgment.

- (a) Explain why Frege might predict (1) is not true when nobody broke into the house.
- (b) Give the (informal or formal) logical form of (1) according to Russell. (Analyze away the single description in (1) in the way we did in class.)
- (c) Does Russell's analysis help avoid the problems for Frege's view? Explain your answer.

**Exercise 3** (8 pts.) Suppose that Mary believes there is a ghost in her closet and hopes that the ghost in her closet will go away. If Mary is superstitious, it certainly seems like what I've just written could be true, even if there are no such things as ghosts. Now consider these two sentences:

- (2) The ghost in Mary's closet will go away.
- (3) Mary hopes that the ghost in Mary's closet will go away.

- (a) Give the (informal or formal) logical form of (2) according to Russell. (Analyze away the one description in (2) in the way we did in class.)
- (b) You'll then see that (3) should have two readings due to a scope ambiguity (owing to "hopes"). Consider the reading on which the description is scoped 'within' the attitude verb "hopes". Russell's analysis appears to attribute some strange hopes to Mary in this case, that many feel are never attributed by (3). Explain the problem.