



Philosophy of Mathematics

2004/2005; 2nd Semester
dr Benedikt Löwe

Homework Set # 1.

Deadline: March 9th, 2005

Reminder. Homework sets will be graded on a scale of **excellent** (15-13) / **good** (12-10) / **OK** (9-7) / **not OK** (6-0) basis. The answer to a “discuss” question must be less than one page and will be graded based on correctness and style of writing. The answer to a “paraphrase” question must be as short as possible without leaving out anything important and will be graded based on style of writing, correctness (including grammar and spelling), conciseness (the shorter the better) and completeness.

Question 1 (15 points).

Paraphrase Plato’s position concerning the rôle of arithmetic for knowledge in general as discussed in the following excerpt from Harold N. Fowler’s translation of *Philebus* (55e-57a):

Socrates. For example, if arithmetic and the sciences of measurement and weighing were taken away from all arts, what was left of any of them would be, so to speak, pretty worthless.

Protarchus. Yes, pretty worthless.

Socrates. All that would be left for us would be to conjecture and to drill the perceptions by practice and experience, with the additional use of the powers of guessing, which are commonly called arts and acquire their efficacy by practice and toil.

Protarchus. That is undeniable.

Socrates. Take music first; it is full of this; it attains harmony by guesswork based on practice, not by measurement; and flute music throughout tries to find the pitch of each note as it is produced by guess, so that the amount of uncertainty mixed up in it is great, and the amount of certainty small.

Protarchus. Very true.

Socrates. And we shall find that medicine and agriculture and piloting and generalship are all in the same case.

Protarchus. Certainly.

Socrates. But the art of building, I believe, employs the greatest number of measures and instruments which give it great accuracy and make it more scientific than most arts.

Protarchus. In what way?

Socrates. In shipbuilding and house-building, and many other branches of wood-working. For the artisan uses a rule, I imagine, a lathe, compasses, a chalk-line, and an ingenious instrument called a vice.

Protarchus. Certainly, Socrates; you are right.

Socrates. Let us, then, divide the arts, as they are called, into two kinds, those which resemble music, and have less accuracy in their works, and those which, like building, are more exact.

Protarchus. Agreed.

Socrates. And of these the most exact are the arts which I just now mentioned first.

Protarchus. I think you mean arithmetic and the other arts you mentioned with it just now.

Socrates. Certainly. But, Protarchus, ought not these to be divided into two kinds? What do you say?

Protarchus. What kinds?

Socrates. Are there not two kinds of arithmetic, that of the people and that of philosophers?

Protarchus. How can one kind of arithmetic be distinguished from the other?

Socrates. The distinction is no small one, Protarchus. For some arithmeticians reckon unequal units, for instance, two armies and two oxen and two very small or incomparably large units; whereas others refuse to agree with them unless each of countless units is declared to differ not at all from each and every other unit.

Protarchus. You are certainly quite right in saying that there is a great difference between the devotees of arithmetic, so it is reasonable to assume that it is of two kinds.

Socrates. And how about the arts of reckoning and measuring as they are used in building and in trade when compared with philosophical geometry and elaborate computations—shall we speak of each of these as one or as two?

Protarchus. On the analogy of the previous example, I should say that each of them was two.

Socrates. Right.

Question 2 (15 points).

Discuss the following statement: “*Realism-in-truth-value* leads to a normative philosophy of mathematics.”