

1. Find two unambiguous (but natural sounding) sentences equivalent to the sentence *The man saw the woman with a telescope*, the first where the man has the telescope, the second where the woman has the telescope.
2. For each of the three ambiguous newspaper headlines I stated in the lecture, rewrite it in a way that avoids the amusing second meaning, while retaining the brevity of a typical headline:
  - (a) Sisters reunited after ten years in checkout line at Safeway.
  - (b) Large hole appears in High Street. City authorities are looking into it.
  - (c) Mayor says bus passengers should be belted.

3. The following notice was posted on the wall of a hospital emergency room:

NO HEAD INJURY IS TOO TRIVIAL TO IGNORE.

Reformulate to avoid the unintended second reading. (The context for this sentence is so strong that many people have difficulty seeing there is an alternative meaning.)

4. You often see the following notice posted in elevators:

IN CASE OF FIRE, DO NOT USE ELEVATOR.

This one always amuses me. Comment on the two meanings and reformulate to avoid the unintended second reading. (Again, given the context for this notice, the ambiguity is not problematic.)

5. Official documents often contain one or more pages that are empty apart from one sentence at the bottom:

*This page intentionally left blank.*

Does the sentence make a true statement? What is the purpose of making such a statement? What reformulation of the sentence would avoid any logical problems about truth? (Once again, the context means that in practice everyone understands the intended meaning and there is no problem. But the formulation of a similar sentence in mathematics at the start of the twentieth century destroyed one prominent mathematician's seminal work and led to a major revolution in an entire branch of mathematics.)

6. Find (and provide citations for) three examples of published sentences whose literal meaning is (clearly) not what the writer intended. [This is much easier than you might think. Ambiguity is very common.]
7. Comment on the sentence "The temperature is hot today." You hear people say things like this all the time, and everyone understands what is meant. But using language in this sloppy way in mathematics would be disastrous.
8. How would you show that not every number of the form  $N = (p_1 \cdot p_2 \cdot p_3 \cdot \dots \cdot p_n) + 1$  is prime, where  $p_1, p_2, p_3, \dots, p_n, \dots$  is the list of all prime numbers?

JUST FOR FUN

1. Provide a context and a sentence within that context, where the word *and* occurs five times in succession, with no other word between those five occurrences. (You are allowed to use punctuation.)
2. Provide a context and a sentence within that context, where the words *and*, *or*, *and*, *or*, *and* occur in that order, with no other word between them. (Again, you can use punctuation.)
3. Prove the fundamental theorem of arithmetic, also called unique-prime-factorization theorem, that states "every positive integer (except the number 1) can be represented in exactly one way apart from rearrangement as a product of one or more primes".