**MATHEMATICAL THINKING: LECTURE 1, ASSIGNMENT 1**

**Kgotso Koete, 22 April 2017**

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.

ANSWER

I'm glad I'm a man, and so is Lola (source: https://en.wikipedia.org/wiki/Syntactic\_ambiguity).

The word of the Lord came to Zechariah, son of Berekiah, son of Iddo, the prophet.

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.

ANSWER: Sisters at a checkout line at Safeway were reunited after ten years.

(b) Large hole appears in High Street. City authorities are looking into it.

ANSWER: Large hole appears in High Street. City authorities are investigating it.

(c) Mayor says bus passengers should be belted.

ANSWER: Mayor says bus passengers should wear seats belts at all times.

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.)

ANSWER:

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.)

ANSWER: Do not use the elevator when there is a fire.

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?

ANSWER: The statement is contradidicted because the same statement typed on the page, means that the page is not actually blank.

The message being communicated does not have a literal meaning, it is only instructive.

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.]

ANSWER 1: Following the tragic JFK Jr. accident, Reuters reported: "Kennedys Board Cutter On Way To Sea Burial"

ANSWER 2:WASHINGTON (Reuters) - Nude dancing took center stage on Wednesday at the U.S. Supreme Court.

ANSWER 3:Juvenile Court to Try Shooting Defendant

Source: http://www.gray-area.org/Research/Ambig/#HEAD

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.

ANSWER: The temperature should be high or low. A high temperature is a descriptor of a 'hot' environment. The descriptor itself cannot be 'hot'.

8. How would you show that not every number of the form N = (p1 p2 p3 : : : pn) + 1 is prime,

where p1; p2; p3; : : : ; pn; : : : 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.)

ANSWER:

A man is painting a sign outside the Dog and Duck and the landlord comes out and says to him: ‘I’d like more space, please, between the ‘dog’ and ‘and’ and ‘and’ and ‘duck’!’”

Source:http://www.thewestmorlandgazette.co.uk/opinion/9964006.A\_sentence\_with\_five\_consecutive\_\_ands\_\_/?ref=rss

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.)