

Assignment 1 Solutions

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Introduction to Mathematical Thinking

Answer 1 The man saw the woman through a telescope.

The man saw the woman holding the telescope.

Answer 2

- (a) Sisters met again after ten years in checkout line at Safeway.
- (b) Large hole appears in High Street. City authorities are investigating it.
- (c) Mayor says bus passengers should wear security belts.

Answer 3 YOU SHOULDN'T IGNORE ANY HEAD INJURY

Answer 4 Meaning 1: "If a fire occurs, do not use the elevator."

Meaning 2: "Do not use this elevator to transport a fire." (In English, "in case of [X]" can sometimes mean "inside a container meant for [X].")

Reformulation: "Do not use the elevator if there is a fire in the building."

Answer 5 That sentence doesn't make a true statement because its existence makes the page not blank.

The purpose of making such a statement is to communicate to the reader why the page isn't filled with content.

Reformulation: "Please go to the next page."

Answer 6

- **The Sentence:** "*Girl hit by car in hospital*"

Citation: *Edinburgh Evening News* (reprinted in various linguistic collections).

Literal Meaning: A girl was inside a hospital building, and a car drove through the hallways and hit her.

Intended Meaning: A girl was hit by a car (somewhere else) and is now a patient staying in the hospital.

- **The Sentence:** “*Drunk gets nine months in violin case*”

Citation: *The British Press* (often cited in journalism manuals).

Literal Meaning: A person was sentenced to live inside a small wooden box used for carrying a violin for nine months.

Intended Meaning: A person who was drunk was involved in a legal case involving a violin and received a nine-month prison sentence.

- **The Sentence:** “*Squad helps dog bite victim*”

Citation: Multiple newspapers (including *The New York Times* in older “Headlines that Bite” features).

Literal Meaning: A group of people (the squad) assisted a dog in its attempt to bite a person.

Intended Meaning: A rescue squad arrived to provide medical help to a person who had been bitten by a dog.

Answer 7 According to Wiktionary, temperature is a measure of cold or heat. With that definition the sentence “the temperature is hot today” is not semantically correct since temperature doesn’t have “hot” or “cold” attributes, it’s just a measure.

Answer 8 My first approach would be computational: write a program to calculate N for increasing values of n and check whether each number is prime. If a composite is found, that would immediately serve as a counterexample. For instance:

$$N = (2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13) + 1 = 30031 = 59 \cdot 509$$

If computation did not produce a counterexample quickly, I would then attempt an analytical argument, perhaps by investigating factorization properties of numbers in this sequence.

Answer Just for Fun

- (1) In digital electronics, we have components called logic gates, and one such gate is called the AND gate. Someone just got delivered a lot of logic gates and he/she is counting them by their operator. If it’s an AND gate they’ll say “And”; if it’s an OR gate they’ll say “OR” and so on.

Sentence: And, and, and, and, and

- (2) Someone just got delivered a lot of logic gates and he/she is counting them by their operator. If it’s an AND gate they’ll say “And”; if it’s an OR gate they’ll say “OR” and so on.

Sentence: And, or, and, or, and