1 Set Theory

To demystify mathematics consider

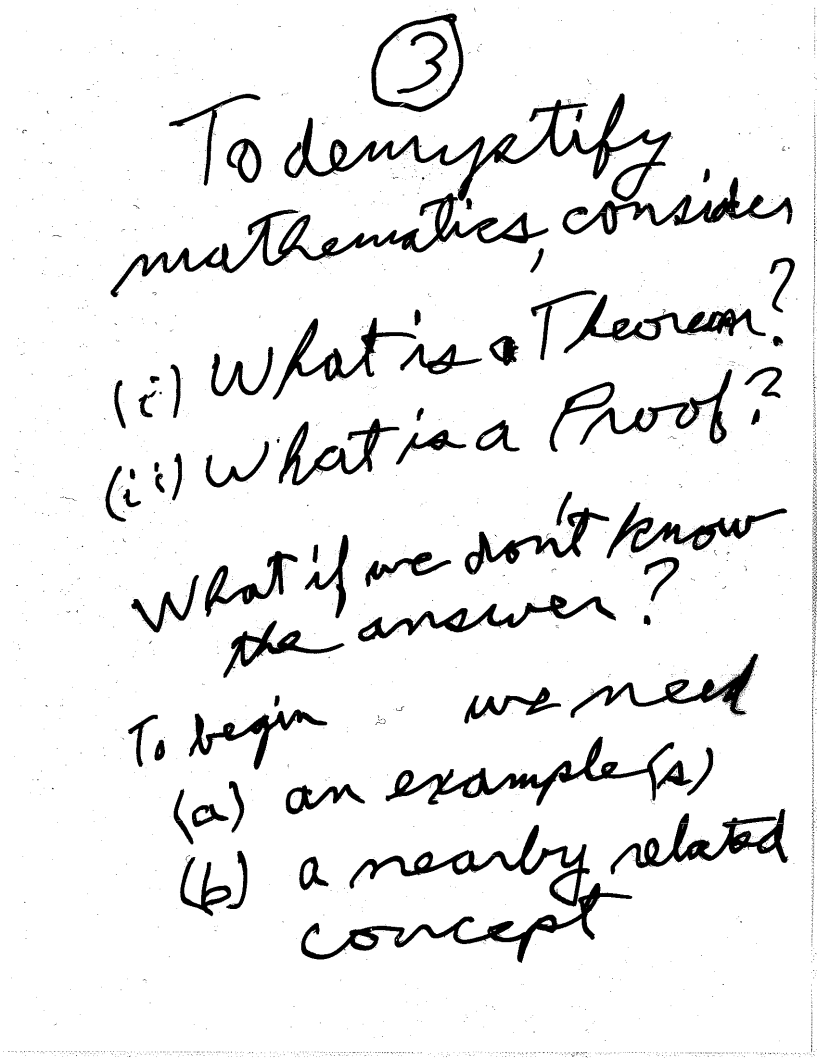
(i) What is a theorem?

(ii) What is a proof?

What if we don't know the answer?
To begin we need

(a) an example(s)

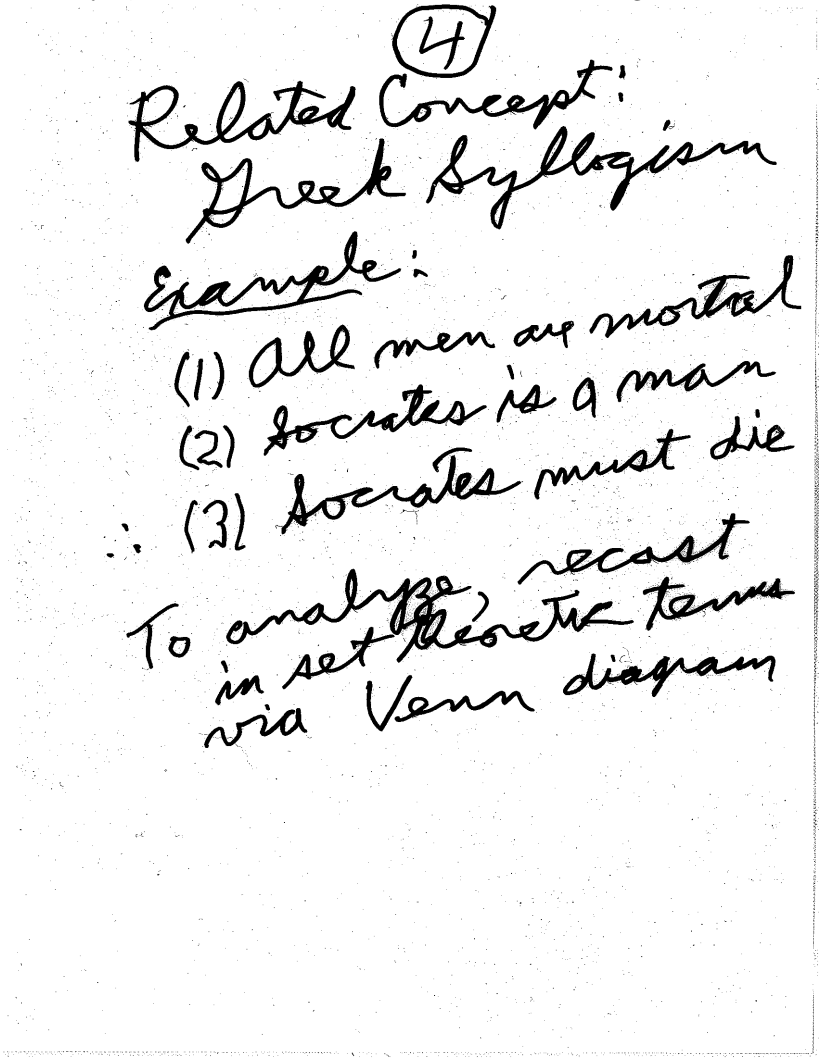
(b) a nearly related concept



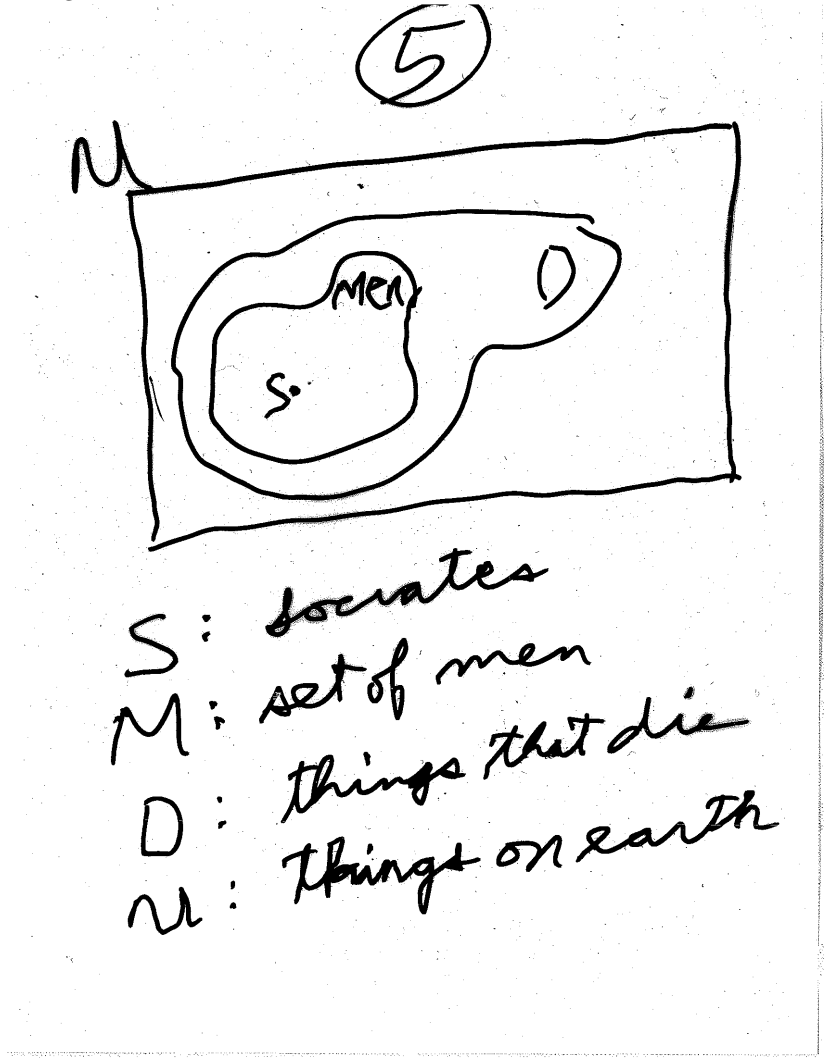
Related Concept: Greek Syllogism
example:

1. All men are mortal.
2. Socrates is a man.
3. Therefore, Socrates must die.

To analyze, recast in set theoretic terms via Venn Diagram.



S: Socrates
M: Set of Men
D: Things that will die
$\mathcal{U}$: Things on Earth



2 Generate $\mathbb{N}$

3 From $\mathbb{Z}$ to $\mathbb{R}$ via ordering

4 Sequence and Limits

5 Limit and Convergence

6 Infinite Series

7 Metric Spaces Part 1

8 Metric Spaces Part 2

Call them C_1, C_2, ... , C_L
Suppose some pairs (i,j) of cities C_i and C_j are adjacent in that they are linked by a non-stop road of some positive, finite, known distance. gij
When is there a path by car between every two cities?

Ans Let $A = (a_{ij})$ be an $L \times L$ incidence matrix where a_{ii} =l and for$i \neq j$