First major work attempted by Descartes, but not completed. A suggested reason why will be given later.

Some scholars think that the chronology of its development does not correspond to the order of the text (a “patchwork thesis”).

The rules are meant to guide the process of discovery of new knowledge. Descartes writes that the ancient mathematicians apparently were in possession of some such rules but did not reveal them for one reason or another.

Descartes clearly wished to make the discovery of mathematical truths his model for all intellectual discovery. His program was to understand all general factual claims in mathematical terms. This must have been the influence of Beekman, who approached mechanical problems in mathematical terms.

Shortly after he abandoned the project of the *Rules*, Descartes told Mersenne that there are metaphysical truths more fundamental than those of mathematics. He also claimed that he came upon his knowledge of physics as a result of investigating God and himself. (Letter to Mersenne of April 15, 1630)

This is part of the significance of the first rule, which postulates the unity of the sciences, a theme that was to persist throughout his writing. The same mathematical tools can be applied toward the solution of all scientific problems. (Rule Four: other sciences are “branches of mathematics.”) The tools would be part of a general “science of order and measure” which would apply to all problems.

This is a major break from Aristotelian science, according to which at least some of the individual sciences have their own proper methods of approach.

It appears that geometry was the branch of mathematics which is central to the method laid out in the *Rules*. The main example of the method, given in the later rules, reduces arithmetic operations to visual geometrical comparisons. An example from Rule Eighteen is addition: |-----|---| + |---| = |-----|---|---|---|.

The human mind is blessed by God with a “natural light of reason” (Rule One). (In Rule Four, Descartes refers to a “spark of the divine.”) It is this natural light (as opposed to the supernatural light of faith) which is to be developed through the observance of the rules. (Note how the metaphor of light
The result of the operations of the rules is *scientia*, or scientific knowledge. Aristotle had treated of scientific knowledge in the *Posterior Analytics* and tried to produce it in his scientific works. *Scientia* is opposed to probable reasoning. The difference is that probable reasoning is open to doubt, whereas *scientia* is perfect knowledge in the sense that it is “certain and evident” and “incapable of being doubted” (Rule Two). Moreover, probable reasoning is based on experience, while *scientia* is based on reason. The emphasis on certainty and the primacy of reason (rationalism) was to remain a theme throughout his later writings.

Descartes seems to be of two minds about what we can be certain of. In Rule Two we are told that only arithmetic and geometry are “free of any taint of falsity or uncertainty.” But the examples given later include that one exists and that one is thinking. Thus he wants to be able to extend certainty beyond mathematics to metaphysics, as he does in his later writings as well. Also in the later writings, he finds some reason to doubt the truths of mathematics.

An examination of the causes of uncertainty give us a clue about what enables us to be certain. Descartes tells us that uncertainty is the result of making assumptions or “conjectures” (Rule Two), which presumably might or might not turn out to be the case. So certainty would be the result of freedom from assumptions. We can get away from assumptions if we take as the objects of our thought only those that are “pure and simple.”

The proper pure and simple objects about which we can be certain are present to the mind in a single view, so to speak. This mental viewing Descartes calls “intuition,” which is: “the conception of a clear and attentive mind, which is so easy and distinct that there can be no room for doubt about what we are understanding” (Rule Three). In Rule Nine, Descartes describes “mental vision,” which should be fixed on a single point. This is something we can do in the visualization of the operation of addition described above.

For Descartes, intuition is the province of reason alone. The simple objects of intuition are not objects of the senses. The problem with sensible objects is their complexity (they are “botched together by the senses or the imagination). In contrast, intuition “proceeds solely from the light of reason.” His examples are, That one exists, that one is thinking, that a triangle is bounded by just three lines, and that a sphere is bounded by a single surface.

Deduction is needed in addition to intuition in order to extend *scientia* to its fullest, allowing us to reach “remote conclusion.” The result of deduction is certainty, but it is not “self-evident” as is intuition. The example Descartes gives is deducing that $3 + 1 = 2 + 2$ from the intuitions that $3 + 1 = 4$ and $2 + 2 = 4$. 

Descartes compares our knowledge through deduction with our knowledge of the continuity of links of a long chain: that the first and last links are part of the same chain. We cannot take in the whole chain in a single glance, but we can inspect each link and determine that it is connected to the next, then moving on and repeating the process.

Thus deduction is described as involving “a movement, or a sort of sequence,” and as involving “a continuous and uninterrupted movement of thought.” At each stage of the deduction, what is presently before the mind is intuited. Thus deduction is a kind of extension of intuition. What is added is an awareness that there is a necessary relation of “following” between the objects that are intuited at a given time. Descartes notes that memory is key here, and in Rule Eleven he describes a process of strengthening memory so that all steps in the deduction can be taken in at once, thus bringing it up to the status of intuition.

At the end of Rule Three, Descartes makes an interesting claim about the certainty of items of faith. If what is believed has its basis in the understanding, then it is known through intuition and deduction. If not, then the result of an act of will, which makes it even more certain. Here we must note that Descartes is using “certain” in the sense of being strongly believed: a non-epistemological sense.

In Rule Four, Descartes makes a very important claim about the nature of human knowledge. “I am convinced that [there are] certain primary germs of truth implanted by nature in human minds.” This is a precursor to his later theory of innate ideas. Also important is the way he describes how they are “stifled” by “the daily reading and hearing of innumerable errors.” This foreshadows the concern in the Meditations about pre-conceived opinions and the way they lead us away from the truth.

The method itself involves taking what is complex and resolving it to its simple elements. The properties of these simples can be intuited, and the complex is rebuilt on the basis of the knowledge we have gained of the simples. Descartes recognized that we can build complexes that do not exist in things, but are creations of the intellect instead.

Descartes says that the “finest example of all” of how the method is to be applied is to investigate the adequacy of the human mind for investigating truth. This application of the method would require a mental vision of the simple elements of the human mind, and Descartes does allow that some spiritual objects are absolutely simple.

As noted above, the Rules was left unfinished. It appears that Descartes found problems that he could not solve by the method. One suggestion, by Henk Bos, is that he could not solve square roots using the visualization technique, and thus equations involving them do not reach the requisite level of certainty. Descartes himself makes use of algebraic symbolization in Rule Sixteen, with an example in which the square root (of 255) is a rational number (15). One could apply a visualization method to this example, but it could not be applied to cases where the root is irrational.