Abstract Is there a philosophy of mathematics in classical Islam? If so, what are the conditions and the scope of its presence? To answer these questions, hitherto left unnoticed, it is not sufficient to present the philosophical views on mathematics, but one should examine the interactions between mathematics and theoretical philosophy. These interactions are numerous, and mainly foundational. Mathematics has provided to theoretical philosophy some of its central themes, methods of exposition and techniques of argumentation. The aim of this chapter is to study some of these interactions, in an effort to give some answers to the questions raised above. The themes which will be successively discussed are mathematics as a model for the philosophical activity (al-Kindī, Maimonides), mathematics in the philosophical syntheses (Ibn Sīnā, Naṣīr al-Dīn al-Ṭūsī), and finally the constitution of *ars analytica* (Thābit ibn Qurra, Ibn Sinān, al-Sijzī, Ibn al-Haytham).

The historians of Islamic philosophy take a particular interest in what some, at times, like to call falsafa (فلسفة). As they see it, it comprises the doctrines of the Being and the Soul developed by the authors of Islamic culture, indifferent to other kinds of knowledge and independent of all determination other than the link they have with religion. These philosophers would, then, be working in the Aristotelian tradition of Neo-Platonism, heirs of late antiquity under the colours of Islam. This historical bias ensures, superficially at least, a smooth passage from Aristotle, Plotinus and Proclus, among others, to the philosophers of Islam from the ninth century on. But the price is high: it often, but not always, results in a pale and impoverished image of philosophical activity and transforms the historian into an archaeologist, although one deprived of the latter’s resources. Indeed, it is not uncommon for the historian to take on as his main task an excavation of the domain of Islamic philosophy, looking for the remnants of Greek works lost in their original but preserved in Arabic translation; or, for want of such a translation, to declare himself satisfied with the fragments of the ancient philosophers often studied with talent and competence by historians of Greek philosophy.
It is true that recently, some historians have turned to doctrines elaborated in other fields beyond the wake of the Greek inheritance: the philosophy of law, developed in magisterial manner by the jurists; the philosophy of Kalām (علم الكلام), that is, of the philosophical theologian, refined and subtle; the Sufism of the great masters as al-Hallāj and Ibn `Arabī and others. Such studies enrich and correct the picture and reflect more faithfully the philosophical activity of the time. They also allow for a better understanding of the place of the Greek inheritance in Islamic philosophy.

But the sciences and mathematics have not yet received the same attention as law, the Kalām, linguistics or Sufism and, even today, the links—in our opinion essential—between sciences and philosophy, and notably between mathematics and philosophy are disregarded. The links between mathematics and philosophy in the works of the philosophers of Islam as al-Kindī, al-Fārābī, Ibn Sīnā, and others are sometimes tackled, but in what must be termed a totally superficial way. Their views on the links between the two domains are described in an attempt to find a connection between these views and the Platonic or Aristotelian doctrines, or sometimes the possible influence of the Neo-Pythagoreans is examined. This means that there is no attempt to understand the repercussions of the philosophers’ mathematical knowledge on their philosophies, and not even the impact on their own philosophical doctrines of their activities as scientists, which of course most of them were. The historians of philosophy are not alone accountable for this deficiency; the responsibility is also that of the historians of sciences. It is true that, to examine the links between the sciences and philosophy, it is necessary to have a particularly wide scope of competence, a much finer linguistic knowledge than what suffices in geometry, syntactically elementary and lexically poor; and a knowledge of the history of philosophy itself. If to these demands we add a conception of the links between science and philosophy that is itself inherited from the present positivism, it is easier to understand the deep indifference of the historians of science in this domain. Yet—we must remind ourselves—the links between sciences and philosophy are an integral part of the history of sciences.

To be sure, the situation is a little paradoxical: for seven centuries, a scientific and mathematical research of the most advanced was elaborated in Arabic in the urban centres of Islam. Is it likely that philosophers who were sometimes themselves mathematicians, physicians, and so on, should have carried out their philosophical activity as recluses, indifferent to the changes that were taking place under their eyes, blind to a succession of scientific results that were following one another? How is this imaginable in the face of an unprecedented profusion of disciplines and successes: astronomy critical of Ptolemaic models, reformed and renewed optics, the creation of algebra, the invention of algebraic geometry, the transformation of Diophantine analysis, the discussion of the theory of parallels, the development of projective methods, and so forth—the philosophers should have been so insensitive as to remain within the relatively narrow frame of the Aristotelian tradition of Neo-Platonism? The apparent poverty of the philosophy of classical Islam is undoubtedly due to its historians rather than to history.

Nevertheless, to we examine the links between philosophy and science or philosophy and mathematics—to which we will limit ourselves here—, only as they appear in the philosophers’ works, is to make only one third of the journey. It is also necessary to question mathematician-philosophers and mathematicians. But to