with the 18 eclipses listed in Table 3.

Table 3

No. of eclipse	Year of the era of Nabonassar	Hour of the middle of the eclipse in Alexandria (Ptolemy's calculation)	The phase of the eclipse (in standard units)
1	26	21	total
2	27	23	3
3	27	20	6
4	127	5	3
5	225	22	6
6	246	24	3
7	256	23	2
8	366	6	1
9	367	23	total
10	546	19	9
11	547	1	total
12	547	2	total
13	574	2	7
14	607	22	3
15	870	20	2
16	878	23	total
17	880	22	10
18	881	4	6

The problem of independent astronomical dating of the lunar eclipses in the Almagest can be stated as follows. We need to find in the past (based on the modern theory of the moon's motion) the set of 18 lunar eclipses which satisfy the following conditions.

1) Each eclipse must have the phase which is given in the Almagest (with an accuracy of 1 unit). The phases of the eclipses were determined by medieval astronomers sufficiently accurately (from visual observation), and after this they have not been changed by recalculations. Thus we can assume that the phase of the lunar eclipses in the Almagest is quoted correctly with an accuracy of 1 unit (because the value of the phase is represented in the Almagest by an integral number of units).

2) The "inter-eclipse times" must correspond to the distances which are listed in the Almagest. But because Ptolemy used several different ancient documents, the years of some eclipses are given relative to different eras. It is impossible to demand an accuracy of better than 2 years (between eclipses). The reason is (see the discussion above) that different eras can employ a different beginning of the year. Hence, the recalculation from one era to another can produce a natural error of 1 year. Consequently, for the difference between two dates, this error can be equal to 2 years.