THE TRAPEZOID IN TWO BABYLONIAN ASTRONOMICAL CUNEIFORM TEXTS FOR JUPITER (ACT 813 & ACT 817) FROM THE SELEUCID ERA [310 BC -75 AD]

ACT 813, Section 5 (of 32): procedure text for the planet Jupiter

Transcription

20 . . . . . .] en sag-ki-gud *šá* 12 sag
21 . . . . . .k]i 1 *ina* 10,45 *a-šà-šú*
22 . . . . .] *ina* 10,45 DUL-DU
23 . . . . . sa]g DI-RI-*tú*
24 . . . . . .] (rest destroyed)

Commentary

We suddenly find here a mathematical problem concerning a "trapezoid whose [upper] width is 12" and whose "area" is "10,45". The "1" in line 21 is probably the length (actually 1,0). The same trapezoid occurs also in No.817 Section 4 (*cf.* p.430).

ACT 817, Section 4 (of 4): procedure text for the planet Jupiter

Transcription

Rev. (?); beginning destroyed

1 [. . .] . . . . . *tú* . . . . *tú* . . . [. . . . 12 sag]
2 *rabitú*(gal-*tú*) 9,30 sag *şehertu*(tur-*tú*) uš-*šú* e[n-nam]
3 10,45 *aná muh* ki-ši tab-*ma ina* ki[-ši lal]
4 dù-dù-bi *šá* sag-ki-gud sag-ki-m[eš]
5 *ana-muh-hi a-ha-meš* tab-*ma* ½-*šú* GIS-*m*[*a*]
6 10,45 a-ša 10,45 *aná-muh* ki[-ši tab-*ma* . . . . .]
7 ni-pi ká *ina lib-bi qaq-qar-àm* [. . . .
8 *aná* ni-pi dib-*iq tam-mar ki-ma* a-š[à]
9 10,45 *šu-ú tam-mar* ki-šú *šu-ú* 12 ta[b]
10 2,24 9,30 sag DI-RI-*tú* a-rá 9,3[0 DU-*ma*]
11 ta 2,24 zi-*ma ša ri-hi* a-rá ki[-ši (?)]
12 2,10,45 DU-*ma* 26,52,30 9,30 [. . . . .

Rest destroyed

Translation and Commentary

". . . . . [12] the larger [side], 9;30 the smaller side; what is its length? 10,45 . . . ." We are dealing with a trapezoid of parallel sides a =12 b = 9;30 and area A = 10,45. Exactly the same configuration appears in No. 813 Section 5 (*cf.* p. 405). The length c should be found and one would expect the following procedure:

$$c = \frac{2A}{a+b} = \frac{10,45}{10;45}$$

Actually, line 3 contains a statement which I do not understand. Then follows: "Procedure for the trapezoid: add the sides to each other and compute(?)half of it and (you find) 10;45." The continuation, however, does not seem to contain the division of the area 10,45 by the 10;45 just found. The text as it stands would best be translated ". . . and (you find)10,45 the area; 10,45 to . . .". The rest of this section is equally uninteligible to me. Toward the end (line 10) the side b = 9;30 seems to be multiplied by itself and the result (1,30;15) is subtracted from 2,24. The remainder 53;45 is not mentioned in the text but as the result of another multiplication its half 26;52,30 appears.

SOURCE: Otto Neugebauer, *Astronomical Cuneiform Texts*, 3 Vols. Lund Humphreys, London, 1955:405,430-31.

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