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The Babylonian "Pythagorean Triangle" Tablet

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Since its publication by Neugebauer and Sachs¹ in 1945, the Old Babylonian tablet, Plimpton 322, has been recognized as by far the most interesting of all documents of this class. The enigma of its interpretation has inspired several analysts, and it has been frequently mentioned as the most telling evidence for the high sophistication of mathematics in this civilization before the Greeks.

The tablet, preserved in Columbia University Library, is not complete. The presence of glue along a broken left edge shows that a part, perhaps somewhat more than half as wide as that preserved, was lost after excavation; this might well be found again, hiding in some other collection. The provenance is unknown, but the script indicates an Old Babylonian date (i.e., first half of second millenium B.C.) and linguistic considerations point to a southern dialect, probably at home in Larsa².

The text is confined to one face of the tablet, though the blank reverse is also ruled for the same pattern of columns of numbers. The preserved text of the obverse contains four columns of numbers the first three of which we shall denote as B, C and D. The fourth column simply numbers the rows, starting with 1 at the head and ending with 15 on the last line at the foot of the tablet. The headings of the columns are somewhat cryptic. Postponing their analysis, it is however clear that they tabulate in sexagesimal notation the following functions of pair of integral numbers, p and q:

$$B = \left(\frac{p^2 + q^2}{2pq} \right)^2, \quad C = p^2 - q^2, \quad D = p^2 + q^2$$

1. Neugebauer and A. Sachs, *Mathematical Cuneiform Texts*, (American Oriental Series, Vol. 29) New Haven, 1945, p. 38ff.
2. According to A. Goetze, MCT p. 146f.

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where the parameters take the following values:

No.	p.	q.	No.	p.	q.	No.	p.	q.
1	12	5	6	20	9	11	1,0	30
2	1,4	27	7	54	25	12	48	25
3	1,15	32	8	32	15	13	15	8
4	2,5	54	9	25	12	14	50	27
5	9	4	10	1,21	40	15	9	5

As Neugebauer and Sachs pointed out it is clear from the forms of columns C and D that the tabulation involves Pythagorean number triples. Indeed, supplying a missing column for $2pq$, we would have the standard formula:

$$(2pq)^2 + (p^2 - q^2)^2 = (p^2 + q^2)^2 \quad I$$

As pointed out too, the parameters have been selected and placed in order so that, although the absolute values are disordered, the ratio p/q declines steadily. In fact, the function B declines very evenly down the column, though we shall now show that this regularity is a fortuitous consequence of the incidental properties of regular numbers.

It is a well-known result that, if the parameters p and q range over all values that are integers, prime to each other, not both odd, and $p > q > 0$, then formula I will produce all the reduced Pythagorean triples just once each. Clearly, this procedure could not without modification produce the pairs of parameters listed above. In the first place, it may be noted that all values for p and q are regular, that is of form $2^\alpha 3^\beta 5^\gamma$, so that their reciprocals are finite sexagesimal fractions. This is not a surprising limitation, since column B which is to be tabulated involves the reciprocals of p and q .

The restriction to regular numbers forces the admission of such a number pair as $(p:q) = (7:3)$ which would otherwise fit between lines 3 and 4 since $75/32 > 7/3 > 2,5/54$. In compensation for this, however, the pair $(9:5)$ actually occurs in the last line of the text, even though both numbers are odd. In connection with this it may be noted that $(9:5)$ yields the triangle with sides $1,30/56/1,46$ and when halved and the sides permuted, this becomes the reduced triangle $28/45/53$ which may be generated by the parameter pair $(7:2)$. This latter pair involves a number which is not regular and may therefore not be included. In

general the parameter pair $(p:q)$ gives, with permuted sides, the same triangle as $(p + q:p - q)$ and this allows one to retrieve several solutions that would otherwise be lost*.

Since all given values of p and q are reasonably small regular numbers, well within the range of attested tables of reciprocals, it is natural to suppose that subject to appropriate limitations, all possible eligible values have been selected and ranked in order of decreasing ratio p/q . To impose such a limitation we must first set bounds upon the values of q and then upon those of p/q . All of the tabulated parameters are found readily to satisfy the inequalities:

$$\begin{aligned} 1 &< q < 60 \\ f &< p/q < g \end{aligned} \quad II$$

where f is such that $9/5 = 1,48$ is included but $16/9 = 1,46,40$ is not, and g is such that $12/5 = 2,25$ is tabulated but $5/2 = 2,30$ is not. It must be noted that $q = 1$ does not occur; the only pair within the range of p/q would be $(2:1)$ and this is recorded instead as the multiple $(1,0:30)$ on line 11. It could not very easily be omitted for the pair $(2:1) \equiv (3:1)$ produces the smallest elementary Pythagorean triangle, $3/4/5$.

Since the tablet contains all and only those pairs of regular numbers, prime to each other and satisfying the inequalities II, it follows that the regularity of decrease in p/q or in column B is simply the result of considerable uniformity in the density of such regular numbers amongst the integers. If the upper bound on q were lifted, one could increase indefinitely the number of pairs available. It can be seen, for example, that even raising it to $q = 1,4$ would yield the pairs $(2,5:1,4)$ and $(2,15:1,4)$ which would have occurred between lines 8 and 9, and between 11 and 12 respectively.

Turning next to the limitation upon p/q , it has already been remarked by Neugebauer that the upper bound, g , is certainly intended to correspond with the isosceles right-angle triangle. Indeed, the first parameter on the list, $(12:5)$ gives the triangle $2,0/1,59/2,49$ where the sides come closest to equality. This condition implies that $2pq < p^2 - q^2$

* This follows from the identities $(p + q)^2 + (p - q)^2 = 2(p^2 - q^2)$, $(p + q)^2 - (p - q)^2 = 4pq$, $2(p + q)(p - q) = 2(p^2 - q^2)$ which show that the triangle with parameters $(p + q : p - q : p - q)$ has sides just the doubles of those of the triangle with parameters $(p : q)$, though with the height and width permuted.

from which it follows that the upper bound, $g = 1 + \sqrt{2}$. This agrees with the limits previously noted, for $2:24 < 1 + \sqrt{2} < 2:30$ since $\sqrt{2} \approx 1;24,51, \dots$

The lower bound is more difficult to understand. At first one might suppose that the table would begin at the 45° triangle and end at 30° , but in fact it stops short of that by just more than one line, the boundary falling between (16:9) and (27:16) which would be lines 16 and 17 on the tablet. Although it is hard to see the significance of the apparent value of the lower bound, it is easy to see that a different minimum limit of $f = 1$ would be very natural. With this condition one would generate all Pythagorean triples with small values of p and q , ranging in shape from those where the side $p^2 - q^2$ was very small compared with the side $2pq$, to those where these sides were almost equal.

Tabulating then all pairs of regular numbers, prime to each other and satisfying the inequalities:

$$\begin{aligned} 1 < p < 60 \\ 1 < p/q < 1 + \sqrt{2} \end{aligned} \quad \text{III}$$

we find only the following possible values:

q	p		
	on proposed continuation of tablet		on tablet
2	3		
3	4	5	
4	5		9
5	6	8	9 12
8	9		15
9	10	16	20
12			25
15	16		32
16	25	27	
18	25		
20	27		
24	25		
25	27	32 36	48 54
27	32	40	40 1,4

30		1.0
32	45	1.15
40		1.21
45	1,4	
50	1.21	
54		2.5

There are then exactly 38 possible pairs of parameters within the limitations cited and of these exactly the first 15 in order of the entry in column B have been written on the tablet. We conjecture that the tablet is an incomplete copy or unfinished work, and in support though not in proof of this note that if the rows were continued over the edge and on to the reverse there would be almost exactly the right amount of space for the complete array to be given in order.

It appears then that the Plimpton tablet is based upon a complete collection of all the Pythagorean triples that can be produced from pairs of parameters that are both regular and prime to each other. The first of the parameters is chosen so that it is a single-place sexagesimal integer (other than unity), and the second is chosen so that the sides of the Pythagorean triangle satisfy the inequality $0 < p^2 - q^2 < 2pq$. This latter condition implies that the triangles rank in shape from a base angle of 45° towards zero angle, the side $p^2 - q^2$ being always shorter than the side $2pq$.

Excluded from the complete collection of Pythagorean triangles are all those whose longer side would have the form $p^2 - q^2$, which is not necessarily a regular number. It would seem that this has been motivated by some necessity to have the longer side of the triangle appear as a denominator of an expression, for which purpose it is essential to have a regular number so as to avoid non-terminating sexagesimal fractions. An expression of exactly this sort appears as column B of the tablet, in which the function tabulated is the square of the ratio of the length of the diagonal, $p^2 + q^2$ to the side $2pq$.

We now further conjecture that the motivation for this, and indeed for the whole tablet, is the expression of the area of the square on the diagonal in terms of units such that the area of the square on the side $2pq$ is one. (See fig. 1). Since column B lists areas corresponding then with the side lengths tabulated in column D, it follows we may suppose that a column A, corresponding to the area of the side $p^2 - q^2$ which is tabu-

Parameters p q	$2pq$ Height	$\left(\frac{p^2 - q^2}{2pq}\right)^2$ Square on Width A	$\left(\frac{p^2 + q^2}{2pq}\right)^2 = A + 1$ Square on Diagonal B	$p^2 - q^2$ Width C	$p^2 + q^2$ Diagonal D	No
12 5	2, 0	59, 0,15	1,59, 0,15	1,59	2,49	1
1, 4 27	57,36	56,56,58,14,50, 6,15	1,56,56,58,14,50, 6,15	56, 7	1,20,25	2
1,15 32	1,20, 0	55, 7,41,15,33,45	1,55, 7,41,15,33,45	1,16,41	1,50,49	3
2, 5 54	3,45, 0	53,10,29,32,52,16	1,53,10,29,32,52,16	3,31,49	5, 9, 1	4
9 4	1,12	48,54, 1,40	1,48,54, 1,40	1, 5	1,37	5
20 9	6, 0	47, 6,41,40	1,47, 6,41,40	5,19	8, 1	6
54 25	45, 0	43,11,56,28,26,40	1,43,11,56,28,26,40	38,11	59, 1	7
32 15	16, 0	41,33,59, 3,45	1,41,33,59, 3,45	13,19	20,49	8
25 12	10, 0	38,33,36,36	1,38,33,36,36	8, 1	12,49	9
1,21 40	1,48, 0	35,10, 2,28,27,24,26,40	1,35,10, 2,28,27,24,26,40	1,22,41	2,16, 1	10
1, 0 30	1, 0, 0	33,45	1,33,45	45, 0	1,15, 0	11
48 25	40, 0	29,21,54, 2,15	1,29,21,54, 2,15	27,59	48,49	12
15 8	4, 0	27, 3,45	1,27, 3,45	2,41	4,49	13
50 27	45, 0	25,48,51,35, 6,40	1,25,48,51,35, 6,40	29,31	53,49	14
9 5	1,30	23,13,46,40	1,23,13,46,40	56	1,46	15
16 9	4,48	22, 8,12,36,15	1,22, 8,12,36,15	2,55	5,37	16
27 16	14,24	17,58,17,38,24,10	1,17,58,17,38,24,10	7,53	16,25	17
5 3	30	17, 4	1,17, 4	16	34	18
1,21 50	2,15, 0	15, 4,53,43,54, 4,26,40	1,15, 4,53,43,54, 4,26,40	1, 7,41	2,13, 1	19
8 5	1,20	14,15,33,45	1,14,15,33,45	39	1,29	20
25 16	13,20	12,45,54,20,15	1,12,45,54,20,15	6, 9	14,41	21
3 2	12	10,25	1,10,25	5	13	22
40 27	36, 0	9,45,22,16, 0,40	1, 9,45,22,16, 0,40	14,31	38,49	23
36 25	30, 0	8,16,16, 4	1, 8,16,16, 4	11,11	32, 1	24
1, 4 45	1,36, 0	7,44,29,13, 8,26,15	1, 7,44,29,13, 8,26,15	34,31	1,42, 1	25
45 32	48, 0	7,14,53,46,33,45	1, 7,14,53,46,33,45	16,41	50,49	26
25 18	15, 0	6,42,40,16	1, 6,42,40,16	5, 1	15,49	27
27 20	18, 0	5,34, 4,37,26,40	1, 5,34, 4,37,26,40	5,29	18,49	28
4 3	24	5, 6,15,22, 3,45	1, 5, 6,15,22, 3,45	7	25	29
32 25	26,40	3,42,55	1, 3,42,55	6,39	27,29	30
5 4	40	3, 2,15	1, 3, 2,15	9	41	31
6 5	1, 0	2, 1	1, 2, 1	11	1, 1	32
32 27	28,48	1,44,55,12,40,25	1, 1,44,55,12,40,25	4,55	29,13	33
9 8	2,24	1,12,15	1, 1,12,15	17	2,25	34
10 9	3, 0	0,40, 6,40	1, 0,40, 6,40	19	3, 1	35
27 25	22,30	0,21,21,53,46,40	1, 0,21,21,53,46,40	1,44	22,34	36
16 15	8, 0	0,15, 0,56,15	1, 0,15, 0,56,15	31	8, 1	37
25 24	20, 0	0, 6, 0, 9	1, 0, 6, 0, 9	49	20, 1	38

Proposed reconstruction of Plimpton 322. The full line shows the extent of the preserved portion; the dotted lines indicate the missing fragment. Lines 16-38 should have been added on the edge and reverse which have been ruled but left blank.

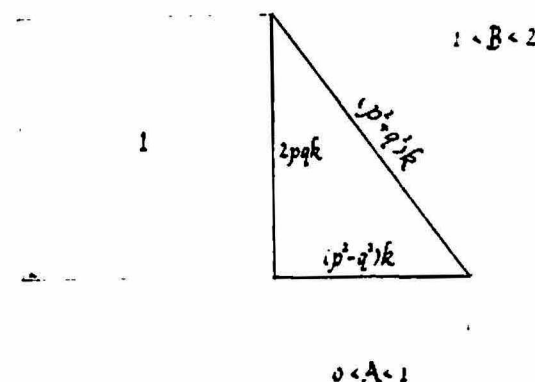


Fig. 1

lated in column D, is now missing. Presumably it would have been to the left of column C, perhaps being preceded by yet another column in which the appropriate values of the third side, $2pq$, would be given as a scaling constant for each of the other sides and their areas.

Because of the limitations upon p and q , it follows that A runs through the range of all available values from unity down to zero, while B , which necessarily equals $A + 1$, runs from two down to unity. This yields, in order, all Pythagorean triangles based on small values of p and q and such that areas on the 'width' and diagonal are terminating sexagesimal multiples of that on the longer side.

This interpretation of the tablet seems consistent with the headings of the columns. In the case of columns C and D, we have respectively, "solving-number of the width" and "solving-number of the diagonal," which we may now interpret as saying that any multiple, k , of these numbers will yield Pythagorean triangles having the required area ratios. For column B, we have, "the *takiltum* of the diagonal which has been subtracted such that the width ...". This we now may interpret as "areal yield of the diagonal which has been diminished such that the

width ($2pq$) is *unity*." An additional difficulty is that the term "sag" may be used both for the height ($2pq$) and for the width ($p^2 - q^2$) of the triangle. When the term is differentiated, as for the nomenclature of rectangles, it seems that "sag" is employed usually for the shorter side, rather than the longer as would appear here. If then "sag" is taken to refer to the shorter side ($p^2 - q^2$), the heading must be interpreted as, "areal yield of the diagonal which has been selected such that the width results."

I am most grateful to Professor Goetze for communicating to me the following comments on the undeciphered heading. He proposes to read the second line as [ša in-]na-as-sà-hu-ù-ma sag i-il-lu-ù so that the interpretation becomes "areal yield of the diagonal which, in case it were subtracted, the width will result therefore." Restore perhaps B form [i-na-]as-sà-hu-ù-ma instead of the N form, "which in case they subtract it." As far as i-il-lu-ù is concerned, the il seems fairly certain. If correct, the spelling i-il . . . points to the presence of a *prima alif*, the final *u* to a *tertiac infirmae*; hence *elūm*. The syntax of the relative sentence is complicated and peculiar. The verb *elūm* is in the *Vocabulary* of Neugebauer and Sachs listed as 'ali (p. 159a). The verb *nasāhum*, in his opinion, can not mean "select."

There remains to discuss the nature of the several scribal errors which occur on the tablet, and the light they must throw on the manner in which it has been tabulated. Since we know already that it must have been compiled in the first place by starting from the pairs of parameters and their restrictions, deriving the Pythagorean triples, and sorting these in order after the area ratios of columns A and B had been computed, it follows that the tablet has been worked from right to left. That is to say, the first column is that which numbers the 38 possible triangles, and the subsequent columns go on to give the coefficients for lengths of diagonal and width and of areal ratio for diagonal and width. Possibly there would be a sixth column for either the length of the third side, or for the area of the square on it which is to be reduced to unity.

If the tablet is to be read from right to left, the sixth column is not necessary. Either of the areal coefficients, A or B, is sufficient to determine uniquely the particular Pythagorean triple which is involved and yield the coefficients of length of the two sides. Thus, the tablet can be computed straightforwardly from right to left, after the parameter pairs have been determined and sorted, and then the table can be used from left to right to find triangles corresponding to given area ratios.

If however, with that perverseness that sometimes characterizes the dogged computations of the Babylonians, the scribe had been given only the left-hand columns, the situation would be different. Given A and B, it would have been necessary to compute $C = 2pq\sqrt{A}$ and $D = 2pq\sqrt{B}$, and for this the sixth column would have been needed. Doing it this way round however could only be seen as a very tedious school exercise in operating with the exact square roots of long numbers.

Of the four significant errors, none occur in column B where computation might be expected to be heaviest. In C.9 the writing of 9.1 for 8.1 seems a mere copyist's slip. In C.13 we find the square of the side length 7,12,1 written instead of the side itself, 2,41. This may be due to the fact that the original data for each triangle included these squares as the data from which columns A and B were computed. It would not have arisen in left to right work unless the sixth column tabulated $(2pq)^2$ which was then multiplied by A and the root taken to yield C; it would seem particularly wasteful tediousness to first form the square of $2pq$ and then take its root again. The error in D.15 may well be accounted for by the fact that this is the sole case in which p and q are both odd. This leads to the triangle 56/1,30/1,46 which may then be halved to 28/45/53, and if both are recorded there may be confusion in which is to be chosen for entry in the column.

The remaining error is in D.2 where 3,12,1 appears instead of the correct value $p^2 + q^2 = 1,42^2 + 27^2 = 1,20,25$. The satisfactory explanation of the incorrect value has been seen often as the chief desideratum of any explication of the tablet's contents. If we assume that 27^2 has been correctly computed as 12,9 it follows that $1,42^2$ must have been miscalculated as 2,52,52 instead of 1,8,16 and this seems not very reasonable. If however, we assume that $1,42^2$ has been correctly taken, then to arrive at 3,12,1 it follows that 27^2 must have been taken as 2,3,45. This latter happens to be the product of 27 and 4,35, the last more recognizable in decimal form as 275. If therefore there is some way in which tables or direct computation could have obtained 27×275 or as $27 \times 25 \times 11$ in error for 27×27 , the major scribal mistake might be accounted for in the process of direct computation from right to left of the tablet. We may note too that the only decompositions as the sum of two squares give $3,12,1 = 1,40^2 + 39^2 = 1,29^2 + 1,0^2$ but neither of these seem generable from the given parameters in an elementary way, and we must

still regard this error as an unsolved problem. This error has also been discussed by Gillings³, whose proposal is virtually the same arithmetically as that discussed here first, by Bruins⁴, whose readings have been rejected by Neugebauer⁵, and by Huber⁶, whose suggestion is that the tablet was worked from left to right.

In summary then, we have shown that the Plimpton tablet contains the first four of five or perhaps six columns that record data for elementary Pythagorean triangles. Of the 38 triangles that can be formed with width less than height and with area of square on width a terminating sexagesimal fraction of that on the height, only the first 15 have been copied, though space is left for the rest. The triangles are ordered and numbered in terms of this fraction starting just less than unity and descending nearly to zero. After the number of the triangle other columns give the lengths of the diagonal and width of the elementary triangle and the ratios of the squares on the diagonal and the width to that on the height. A last column may have given the third side, the height of the triangle, but this is not essential for use. The tablet seems to have been computed straightforwardly, starting from the available values of p and q which comprise a closed set of small numbers, the values of q in particular being restricted to one-place sexagesimal integers.

The notation of the column headings plainly refers to triangles and it seems virtually impossible to regard this now as a pretext for manipulation that is primarily algebraic and directed to number theoretic problems. Indeed, if one takes columns C and D as independent variables which, in Babylonian style would satisfy a pair of simultaneous equations, it proves very difficult to suggest a reasonable way in which column B could appear as a parameter of solution. The same holds if one considers p/q and q/p as the independent variables which should then be such that their product is unity and some other suitable function involves B in a simple fashion.

Since the sophistication shown in this tablet appears to be related to mensuration of triangles rather than to equation solving, it may be characterized as follows. Firstly, there was ready familiarity with the method by which Pythagorean triangles can be generated from two para-

3. R. J. Gillings, *The Australian Journal of Science* 16, 1953, pp. 54-6.

4. E. M. Bruins, *Sumer* 11, 1956, pp. 117-21.

5. O. Neugebauer, *The Exact Sciences in Antiquity*, Providence 1957, p. 50.

6. P. Huber, *L'Enseignement mathématique* 3, 1957, p. 19.

eters. Secondly, we have the intriguing technique of grading and measuring the shape of right-angle triangles in terms of the ratio of the squares on width and diagonal to that on the height, the height always being the greater of the two sides including the right angle.

Regarding the first of these characteristics, I am indebted to my colleague, Dr. Asger Aaboe, for the suggestion that this method of generating Pythagorean triangles from two parameters could have arisen from consideration of a certain geometrical problem attested by an Old Babylonian text. In what follows I present his argument based upon a tablet from Susa, recently published by Bruins and Rutten⁷. The text is concerned with the relationship between altitude, base, and side of an isosceles triangle and the radius of its circumscribed circle. The tablet shows a diagram, somewhat like Fig. 2, and assigns the following values to the various parts:

$$\begin{aligned} p &= 30 & s &= 50 \\ p - r &= 8;45 & r &= 31;15 \end{aligned}$$

hence $p = 40$.

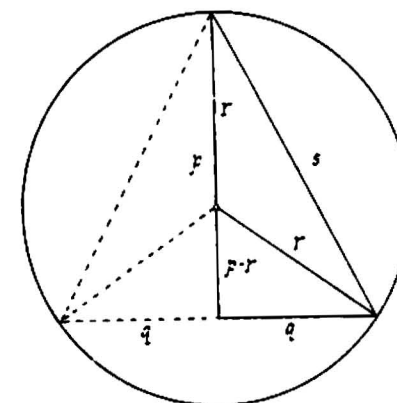


Fig. 2

The nature of these numbers makes it plausible that the values of q and s , or q and p are given, and that the value of r is derived. The equation determining r is $(p - r)^2 + p^2 = r^2$ which reduces to $r = \frac{p^2 + q^2}{2p}$.

7. E. M. Bruins and M. Rutten, *Textes mathématiques de Suse*. Paris, 1961, Texte I, pp. 22-3.

which is a *rational* expression in q and p . We have then that $p - r = \frac{p^2 - q^2}{2p}$, q and $r = \frac{p^2 + q^2}{2p}$ form a right triangle; hence so will

$$\begin{aligned}x &= 2p \cdot (p - r) = p^2 - q^2 \\y &= 2pq \\z &= 2p/r = p^2 + q^2\end{aligned}$$

which is our set of formulas if p and q are properly restricted. It should be noted that r is rational if p and q are, regardless of the nature of s . We have then a way in which the standard generating formulas for Pythagorean triples would readily have been obtained, though of course the suitable restrictions upon p and q are another matter. It would be absurd to suggest that the Babylonians were interested in or aware of the necessary and sufficient conditions for all possible triples to be generated once only.

Regarding the second of the characteristics, that of grading the shape of Pythagorean triangles, this may throw new light on a recent paper by Gillings⁸, commenting on the right angle triangle problem text, BM 34568. To paraphrase the principal argument here, it is noted that in any such triangle the fundamental parameters of the two basic forms of the same shaped triangle can appear as a function of the lengths of sides in the simple forms:

$$\begin{aligned}\frac{p}{q} &= \frac{\text{height}}{\text{diagonal} - \text{width}} \\ \frac{p+q}{p-q} &= \frac{\text{width}}{\text{diagonal} - \text{height}}\end{aligned}$$

In the particular example cited, which is that of the 3/4/5 triangle, it is attested that the diagonal may be taken either as the width plus one half the height, or as the height plus one third of the width. That is to say, the ratios noted above are familiar as 2 and 3, or rather as their reciprocals. This may now be taken as further evidence that the Babylonians were aware of the significance of the parameter ratio p/q in determining the shape of the right angle triangle and also that they were aware of the similar shape given by the equivalent ratio $\frac{p+q}{p-q}$. On the evidence of the

8. R. J. Gillings, *The Australian Journal of Science* 26, (1964) pp. 225-6.

Plimpton tablet, we can now hazard a guess that such relations were known particularly well for those triangles for which both ratios and their reciprocals were conveniently simple sexagesimal numbers. This is quite a strong limitation, implying that p , q , $p + q$ and $p - q$ must all be regular. We know at least from BM 34568 that it was familiar in the simplest case of $p = 2$, $q = 1$ which yields the 3/4/5 triangle.

Setting all the evidence together, it seems to show that already in Old Babylonian times, a traditional corpus was established enumerating all the right angle triangles that could be generated from reasonably small parameter pairs, and tabulating for them in order of magnitude such of the shape-dependent functions of side length that yielded terminating sexagesimal numbers. In a way, it may be likened (though not precisely) to the tabulation, for those suitable angles, of those special trigonometric functions taking convenient rational values. Thus, on a purely arithmetical basis there is erected a "trigonometric" corpus that could be used for practical mensuration, or more probably for the setting out of series of practice problems in mensuration, all of which would be capable of exact numerical solution. It is indeed just such extensive series of conveniently constructed numerical examples in mensuration that constitute the greater part of the Babylonian mathematical corpus.