2.2 Babylonian numerals

Almost 4000 years ago the Babylonians wrote numbers using a place-value system based on sixty. They wrote in soft clay with a stick that made two different wedge-shaped marks, for one 𒁹 and for ten 𒌋.

To write the numbers from 1 to 59, they put together ones and tens. For instance, thirty-two was 𒌋𒌋𒁹𒁹.

1. What are these numbers?

   a) 𒌋𒌋𒁹𒁹𒁹 ..... | b) 𒌋𒌋𒌋 .....

2. Write each number in Babylonian.

   a) 17 ..... | b) 53 .....

For 60 to 3599, they put a second group of these symbols to the left of the first one, separated by a space. The value of the whole thing was the value of second group multiplied by 60 and added to the value of the first group. For instance,

$$\text{𒁹𒁹 𒌋𒁹𒁹} \quad \text{is} \quad 2 \cdot 60 + 12 = 132$$

3. What are these numbers?

   a) 𒁹 𒌋𒌋𒁹 .....

   b) 𒌋𒁹 𒌋𒁹𒁹𒁹 .....

   c) 𒌋 𒌋𒁹𒁹 𒌋𒌋𒁹𒁹𒁹 .....

4. Write each number in Babylonian.

   a) 125 .....

   b) 792 .....

   c) 3,154 .....

5. In our notation, how much is 60? .....

   How much is $60^2 = 3{,}600$? .....

   How much is 60^3? .....

6. What is missing in Babylonian numerals?

Numbers from 3600 on were written by using more groups farther to the left, multiplied by 602, 603, and so on. For instance,

 is $11 \cdot 60^2 + 2 \cdot 60 + 21 = 39{,}741$

7. Explain how 7,883 is

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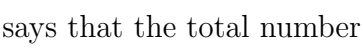
8. Write each number in Babylonian

   a) 50,000.....

   b) 11,425.....

The Babylonians' place-value system let them write large numbers easily with only two symbols. But it had one big flaw: they left a place empty for zero. There was no way to show that a place had been skipped!

For instance,  could mean 1, or 60, or $60^2 = 3{,}600$ or something even bigger. The only way to know was to figure out what made sense for the situation

9. A clay tablet says that the total number of some things is  , but the part that says what is being counted is broken off.

   a) If this is a shepherd counting his sheep, what number is it likely to be?

   b) If this is King Hammurabi counting his soldiers, what numbers are more likely?