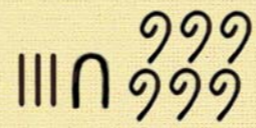
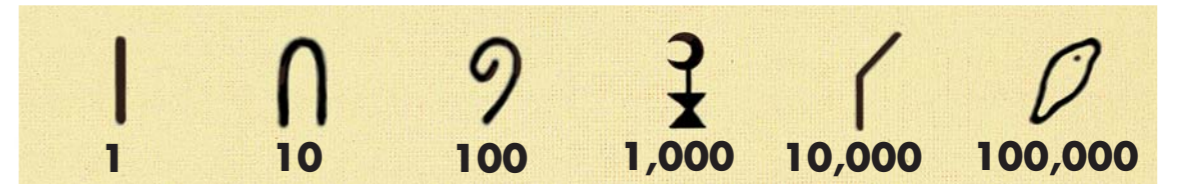


EGYPTIAN NUMERALS

Thousands of years ago, the Egyptians were carving words and numerals on stone walls and monuments. Their writings told stories about the great deeds of their pharaohs. The type of writing used by the ancient Egyptians is called *hieroglyphic*, and the symbols are *hieroglyphs*. The Egyptians used hieroglyphics for their numbers, too. They used strokes for numbers from 1 to 9. They used symbols for 10 and its multiples up to 1,000,000. (The Egyptians grouped numbers by tens, as we do.) Each symbol was repeated as many times as necessary to form a number. (For example, for 4,000, Egyptians would write the symbol for 1,000 four times.) Numerals were usually written with the highest value on the right. There was no symbol for zero.

HERE ARE SOME EXAMPLES OF EGYPTIAN HIEROGLYPHIC NUMERALS:



$$= (3 \times 1) + (1 \times 10) + (6 \times 100) = 613$$



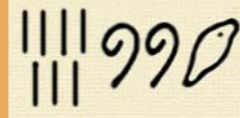
$$= (9 \times 1) + (5 \times 100) + (1 \times 1000) = 1,509$$



$$= (10 \times 3) = 30$$



- ① (a) 97
(b) 113
(c) 48
(d) 59



- ② (a) 100,207
(b) 127
(c) 1,217
(d) 10,293



- ③ (a) 213
(b) 3,102
(c) 3,021
(d) 34



- ④ (a) 2,408
(b) 10,304
(c) 12,394
(d) 1934

NOW YOU TRY IT!
Choose the correct value in standard numerals for the four Egyptian numerals at the left. Check your answers at the bottom.

Answers: 1. d 2. a 3. b 4. c

CHINESE ROD NUMERALS

About 2,000 years ago the Chinese developed a number system we now call *rod numerals*. These numbers were originally made using small bamboo rods. The rods could be grouped either horizontally or vertically. To show place value, the Chinese alternated horizontal and vertical rods. Numerals with the highest value were written at the left.

VERTICAL



HORIZONTAL

HERE ARE SOME EXAMPLES:



To write 8 in Chinese rod numerals, you would write:

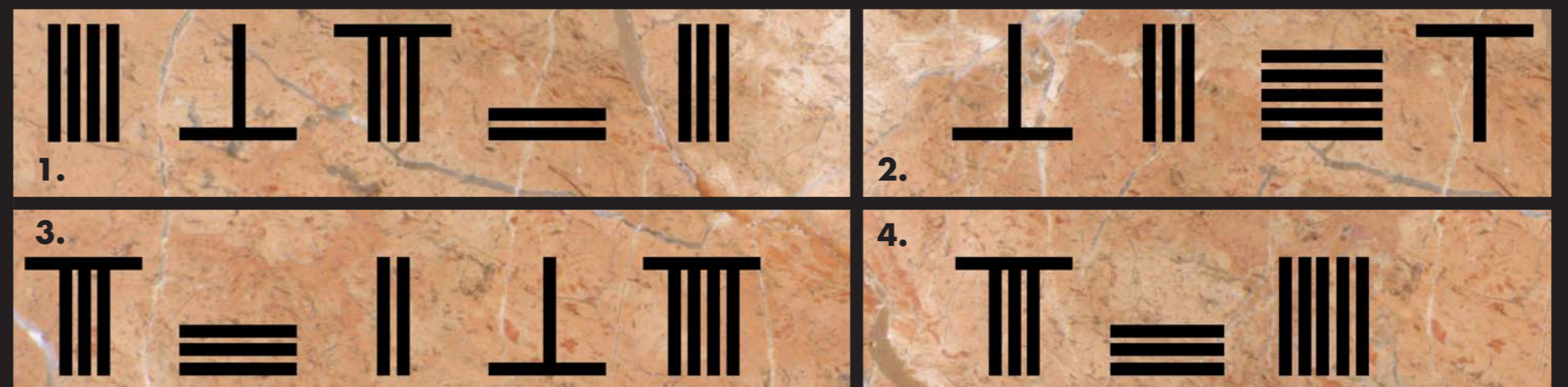


To write 58, you would write:



NOW YOU TRY IT!

What is the standard number equivalent for each of these Chinese rod numerals at the right? Check your answers below.



Answers: 1. 4632 2. 6321 3. 83274 4. 834

MAYA NUMERALS



Many centuries ago, the Maya of Mexico and Central America were building great temples and large cities. They were able to write numbers into the millions by using place value and three symbols: a *dot* for one unit, a *bar* for five units, and a *shell-like symbol* for zero. The Maya grouped by twenties (not tens, the way we do), and placed the larger groups above the smaller groups in a number. (We put the larger numbers to the left.)

NUMBER KEY

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19

HERE ARE SOME EXAMPLES OF MAYA NUMERALS:

$$\begin{array}{l}
 20\text{'s} \quad \begin{array}{|c|} \hline \text{—} \\ \hline \end{array} = (5 \times 20) = 100 \\
 1\text{'s} \quad \begin{array}{|c|} \hline \cdot \\ \hline \text{—} \\ \hline \end{array} = (12 \times 1) = 12 \\
 \qquad \qquad \qquad + \\
 \qquad \qquad \qquad = 112
 \end{array}$$

$$\begin{array}{l}
 20\text{'s} \quad \begin{array}{|c|} \hline \cdot \\ \hline \text{—} \\ \hline \end{array} = (19 \times 20) = 380 \\
 1\text{'s} \quad \begin{array}{|c|} \hline \text{—} \\ \hline \end{array} = 0 \\
 \qquad \qquad \qquad + \\
 \qquad \qquad \qquad = 380
 \end{array}$$

NOW YOU TRY IT!

Using the lettered Arabic answer choices, choose the correct value in standard numerals for the Maya numerals below. Check your answers at the bottom of the page.

- | | | |
|--|------|---------|
| | 20's | (a) 23 |
| | 1's | (b) 180 |
| | | (c) 36 |
| | | (d) 18 |
- | | | |
|--|------|-----------|
| | 20's | (a) 91 |
| | 1's | (b) 170 |
| | | (c) 216 |
| | | (d) 2,160 |
- | | | |
|--|------|---------|
| | 20's | (a) 39 |
| | 1's | (b) 399 |
| | | (c) 180 |
| | | (d) 899 |
- | | | |
|--|------|---------|
| | 20's | (a) 130 |
| | 1's | (b) 26 |
| | | (c) 260 |
| | | (d) 13 |

Answers: 1. d 2. c 3. b 4. c

MESOPOTAMIAN NUMBERS

Mesopotamia and *Babylonia* were ancient lands in what is roughly present-day Iraq. Thousands of years ago the Mesopotamians were trading with neighbors near and far. To record their accounts, merchants made wedge-shaped marks on clay tablets with a pointed stick, or *stylus*. These marks are called *cuneiform*, from the Latin word (*cuneus*) for wedge.

CUNEIFORM NUMERALS USED TWO TYPES OF MARKS:

A vertical wedge stood for 1:



A horizontal wedge stood for 10:



Babylonians wrote their numbers from left to right, as we do. However, instead of using a base 10 system like ours, they used a base 60 system. A unit in the first place (farthest to the right) stood for 1; in the second place (second from the right), it stood for 60; in the third place, 3,600; etc. Within each place, vertical marks were used for units from 1 to 9, with horizontal marks used for groups of ten. The horizontal marks (tens) appeared to the left of the vertical marks (units) in each place-value position.

HERE ARE SOME EXAMPLES OF MESOPOTAMIAN NUMERALS:



$$(3 \times 10) + 4 = 34$$



$$(1 \times 60) + (3 \times 10) = 90$$



$$(6 \times 60) + 8 = 368$$



$$(24 \times 60) + 30 = 1,440 + 30 = 1,470$$



$$(32 \times 60) + (50 + 9) = 1,920 + 59 = 1,979$$

Although the Babylonian base 60 system is no longer used, it has left traces in math we use every day. Examples include measuring *time* (1 hour = 60 minutes), and measuring the *degrees of a circle*.

NOW YOU TRY IT!

What Arabic number does each of the Mesopotamian numbers below equal? (Check your answers at the bottom.)

1	
2	
3	
4	
5	

Answers: 1. 116 2. 312 3. 610 4. 245 5. 3,025