

Solutions to select problem parts:

Egyptian Numbers and Arithmetic

1. Express each of the given numbers in Egyptian hieroglyphics.

- (a) 1492. (d) 70,807.
(b) 1999. (e) 123,456.
(c) 12,321. (f) 3,040,279.

- (a) $\begin{array}{l} || \text{oooo} \text{ 9999} \\ \text{oooo} \end{array}$
(c) $| \text{oo} \text{ 999} \text{ } \frac{1}{2} \frac{1}{2} |$
(e) $\begin{array}{l} ||| \text{ooo} \text{ 9999} \text{ } \frac{1}{2} \frac{1}{2} \frac{1}{2} | | \text{ 9} \\ ||| \text{ oo} \end{array}$

2. Write each of these Egyptian numbers in our system.

(a) $\begin{array}{l} |||| \text{ooo} \text{ 999} \\ |||| \text{ } \text{ 999} \end{array}$

2. (b) $\begin{array}{l} \text{ooo} | | | \text{ 9} \\ \text{ooo} | \end{array}$

(c) $\begin{array}{l} || \text{oo} \text{ 999} \text{ } \frac{1}{2} \frac{1}{2} \frac{1}{2} | | | \\ \text{ 9} \quad \quad \quad | | \end{array}$

- (a) 648. (b) 140,060.

(d) $\begin{array}{l} \text{ooo} \text{ } \frac{1}{2} \frac{1}{2} \text{ 999} \text{ } \frac{1}{2} \\ \text{oo} \text{ } \frac{1}{2} \frac{1}{2} \end{array}$

3.

Perform the indicated operations and express the answers in hieroglyphics.

(a) Add $|| \text{ 99} \text{ } \frac{1}{2} \frac{1}{2}$

and $||| \text{ 999} \text{ } \frac{1}{2} |$

3. (a) 83. (b) 470. (c) 29,005. (d) 5634.

(b) Add $\begin{array}{l} |||| \text{ } \frac{1}{2} | | | \\ ||| \text{ } | | | \end{array}$

and $\begin{array}{l} ||| \text{ o} \text{ 99} | | | \\ || \quad \quad | | \end{array}$

(c) Subtract $\begin{array}{l} ||| \text{ oo} \text{ 9} \\ ||| \end{array}$

from $|| \text{ ooo} \text{ 99}$


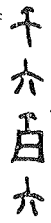
(d) Subtract $\begin{array}{l} ||| \text{ ooo} \text{ 999} \\ | \text{ o} \end{array}$

from $|| \text{ ooo} \text{ } \frac{1}{2}$


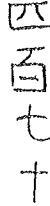


Chinese Numbers

4. Notice that if only one of a certain power of 10 is intended, then the multiplier 1 is omitted. Express each of the given numbers in traditional Chinese numerals.

- (a) 236. (d) 1066.
(b) 1492. (e) 57,942.
(c) 1999. (f) 123,456.

4. (a) 236 =  (d) 1606 = 

5. Translate each of these numerals from the Chinese system to our numerals.

(a)  (b)  (c)  (d) 

5.

- (a) 83. (b) 470. (c) 29,005. (d) 5634.


Babylonian numbers


6. Express each of the given numbers in Babylonian cuneiform notation.

- (a) 1000. (d) 1234.
(b) 10,000. (e) 12,345.
(c) 100,000. (f) 123,456.

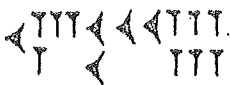
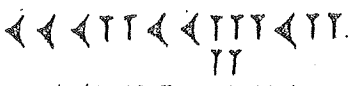

6.

(d) 1234 = 20,34 = 


(e) 12,345 = 3,25,45 = 

(f) 123,456 = 34,17,36 = 

7. Translate each of these into a number in our system.

- (a)  (b)  (c) 

7.

(a) Among other possibilities,  = 886.

8. Problems 2, 9, and 10 from Ch. 1, p. 28 of Katz.

next pages →

8-2.

1	34
'2	68
4	136
8	272
'16	544
18	612

1	5	
10	50'	(multiply by 10)
2	10	(double first line)
4	20	(double third line)
8	40'	(double fourth line)
2	2 2'	(halve first line)
<u>10</u>	<u>2'</u>	(invert third line)
18 2 10	93	

8-9

$x + \frac{1}{7}x = 19$. Choose $x = 7$; then $7 + \frac{1}{7} \cdot 7 = 8$. Since $19 \div 8 = 2\frac{3}{8}$, the correct answer is $2\frac{3}{8} \times 7 = 16\frac{5}{8}$.

8-10

$(x + \frac{2}{3}x) - \frac{1}{3}(x + \frac{2}{3}x) = 10$. In this case, the "obvious" choice for x is $x = 9$. Then 9 added to $\frac{2}{3}$ of itself is 15, while $\frac{1}{3}$ of 15 is 5. When you subtract 5 from 15, you get