

2.1 Numeration Systems

Number--an idea that represents a quantity.

Number uses:

- 1.
- 2.
- 3.

Natural numbers =

Whole numbers =








Historical Numeration Systems:

1. Tally System

Positive Characteristics/Benefits:

2. Egyptian System

Positive Characteristics/Benefits:

Decimal Number	Egyptian Symbol	
1 =		staff
10 =		heel bone
100 =		coil of rope
1000 =		lotus flower
10,000 =		pointing finger
100,000 =		tadpole
1,000,000 =		astonished man

Ex 1 What are the values of these numbers?



3. Roman Numeral System

I	V	X	L	C	D	M
1	5	10	50	100	500	1000

Example:

XXXII = 32

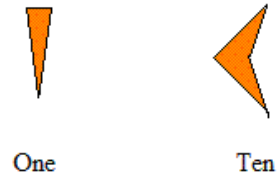
XLVIII = 48

Positive Characteristics/Benefits:

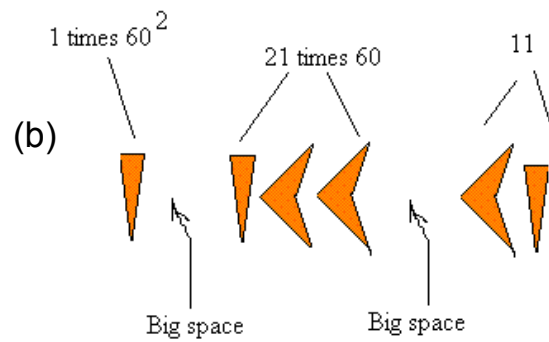
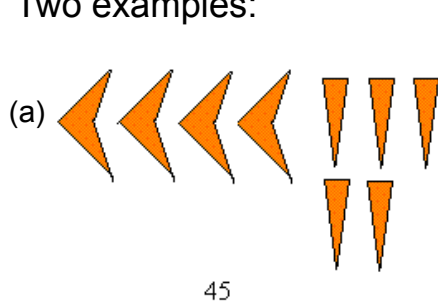
I	1	XXI	21	XLI	41	LXI	61	LXXXI	81
II	2	XXII	22	XLII	42	LXII	62	LXXXII	82
III	3	XXIII	23	XLIII	43	LXIII	63	LXXXIII	83
IV	4	XXIV	24	XLIV	44	LXIV	64	LXXXIV	84
V	5	XXV	25	XLV	45	LXV	65	LXXXV	85
VI	6	XXVI	26	XLVI	46	LXVI	66	LXXXVI	86
VII	7	XXVII	27	XLVII	47	LXVII	67	LXXXVII	87
VIII	8	XXVIII	28	XLVIII	48	LXVIII	68	LXXXVIII	88
IX	9	XXIX	29	XLIX	49	LXIX	69	LXXXIX	89
X	10	XXX	30	L	50	LXX	70	XC	90
XI	11	XXXI	31	LI	51	LXXI	71	XCI	91
XII	12	XXXII	32	LII	52	LXXII	72	XCII	92
XIII	13	XXXIII	33	LIII	53	LXXIII	73	XCIII	93
XIV	14	XXXIV	34	LIV	54	LXXIV	74	XCIV	94
XV	15	XXXV	35	LV	55	LXXV	75	XCV	95
XVI	16	XXXVI	36	LVI	56	LXXVI	76	XCVI	96
XVII	17	XXXVII	37	LVII	57	LXXVII	77	XCVII	97
XVIII	18	XXXVIII	38	LVIII	58	LXXVIII	78	XCVIII	98
XIX	19	XXXIX	39	LIX	59	LXXIX	79	XCIX	99
XX	20	XL	40	LX	60	LXXX	80	C	100
								D	500
								M	1000

4. Babylonian Numeration System

Positive Characteristics/Benefits:



Two examples:

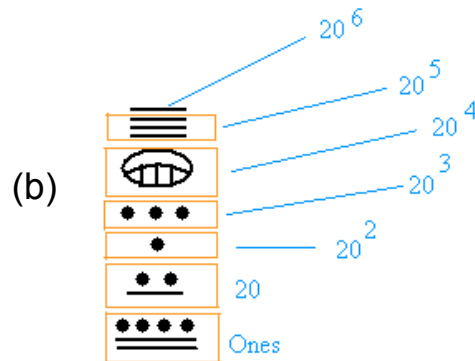
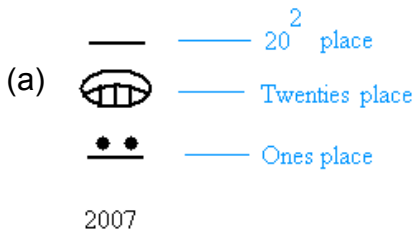


5. Mayan Numeration System

Positive Characteristics/Benefits:

0 	1 	2 	3 	4
5 	6 	7 	8 	9
10 	11 	12 	13 	14
15 	16 	17 	18 	19
20 	21 	22 	23 	24
25 	26 	27 	28 	29
Mayan positional number system				

Two examples:



6. Hindu-Arabic Numeration System (*our current system*)

Positive Characteristics/Benefits:

Other Bases

We still have place value!!!

Base 5:

Ex Convert 12_5 to base 10.

Ex Convert 39 to base 5.

Ex Convert 341_5 to base 10.

Ex Convert 401 to base 5.

Convert these numbers to base 10.

(a) 1011101_2

(b) 1237_8

(c) $2ET_{12}$

(d) 654_7

Convert these numbers from base 10 to the indicated base.

(a) 76 to base 2

(b) 982 to base 4

(c) 131 to base 3

(d) 519 to base 8