

Powers of Twelve

One advantage of using a base larger than ten is that numbers written in the larger base contain more. For example, the largest base ten number with five digits is 99999, while the largest base twelve number with five digits is $\text{E}\text{E}\text{E}\text{E}\text{E}$ - and this, expressed in base ten, is 20736 - well over twice as much as the largest base ten number with five digits.

Using base twelve numeration an odometer with seven digits would register up to a total of $\text{E},\text{E}\text{E}\text{E},\text{E}\text{E}\text{E}$ miles - or, in decimal terms, 35,831,807 miles, while a decimal one would only reach 9,999,999 miles.

Here is a list of some powers of twelve and ten expressed in base ten. By the time we reach, for example, the ninth power the base twelve number contains in its ten columns over 5 times as much as the corresponding base ten expression.

Power	of twelve	of ten
1	12	10
2	144	100
3	1,728	1,000
4	20,736	10,000
5	248,832	100,000
6	2,985,984	1,000,000
7	35,831,808	10,000,000
8	429,981,696	100,000,000
9	5,159,780,352	1,000,000,000
10	61,917,364,224	10,000,000,000
11	743,008,370,688	100,000,000,000
12	8,916,100,448,256	1,000,000,000,000

The sixth power of twelve has been called a "miliad", similar to the "million" for the sixth power of ten.

The twelfth power of twelve has been called a "biliad", similar to the English "billion" for the twelfth power of ten.

NB: in the US (and in UK government circles) the ninth power of ten is called a billion, and the twelfth power of ten is called a trillion. The English trillion has eighteen zeroes - three lots of 6.